

前 言

本标准根据 ISO 3098-5:1997《技术产品文件 字体 第 5 部分 拉丁字母、数字和符号的 CAD 字体》编制而成,在技术内容和编写格式上等同采用该国际标准。

本标准提出了在计算机辅助设计的技术产品文件中所要用到的拉丁字母、数字和符号的书写形式及要求,使 CAD 的开发与应用单位有章可循。技术产品文件中的汉字标准要求应参见 GB/T 13362.4—1992、GB/T 13362.5—1992、GB/T 13844~13848—1992。

本标准由中国机械工业联合会提出。

本标准由全国技术产品文件标准化技术委员会归口。

本标准起草单位:机械科学研究院、北京清华京渝天河软件公司。

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ISO 前言

ISO(国际标准化组织)是由各国标准化团体(ISO 成员团体)组成的世界性的联合组织,制定国际标准的工作通常由 ISO 的技术委员会完成。各成员团体若对某技术委员会确立的项目感兴趣,均有权参加该委员会的工作。与 ISO 保持联系的各国际组织(官方的或非官方的)也可参加有关工作,在电工技术标准化方面 ISO 与国际电工委员会(IEC)保持密切合作关系。

由技术委员会通过的国际标准草案提供各成员团体表决,需取得至少 75%参加的成员团体同意,才能作为国际标准正式发布。

国际标准 ISO 3098-5 是由国际标准化组织 ISO/TC10“技术产品文件”的 SC1 分技术委员会“基本原则”负责起草。

ISO 3098 在“技术产品文件—字体”题目下包含以下内容:

- 第 0 部分:基本要求
- 第 1 部分:常用字符
- 第 2 部分:希腊字母
- 第 3 部分:拉丁字母的发音符号和特殊符号
- 第 4 部分:斯拉夫字母
- 第 5 部分:拉丁字母、数字和符号的 CAD 字体

技术产品文件 字体
拉丁字母、数字和符号的 CAD 字体

GB/T 18594—2001
idt ISO 3098-5:1997

Technical product documentation—Lettering
CAD lettering of the Latin alphabet numerals and marks

1 范围

本标准规定了使用计算机辅助设计和制图(CADD)编制的技术产品文件中字体的基本要求,包括 CAD 字体的基本约定和规则。

本标准适用于数字化书写技术和绘图系统。

2 引用标准

下列标准所包含的条文,通过在本标准中引用而构成本标准的条文。本标准出版时,所示版本均为有效。所有标准都会被修订,使用本标准的各方应探讨使用下列标准最新版本的可能性。

GB/T 13361—1992 技术制图 通用术语

GB/T 14691—1993 技术制图 字体(eqv ISO 3098/1—1974)

GB/T 15751—1995 技术产品文件 计算机辅助设计与制图 词汇(eqv ISO/TR 10623—92)

3 定义

本标准采用 GB/T 13361 和 GB/T 15751 中所给出的定义。

3.1 比例间隔 proportional spacing arrangement

矢量字符按书写方向,字宽间隔和原字宽成比例。

3.2 等宽间隔 tabular spacing arrangement

矢量字符按书写方向,采用等宽间隔,和原字宽无关。

4 一般要求

CAD 字体的基本要求见 GB/T 14691。

5 CAD 字体的要求

5.1 CAD 字体的类型有:

——CB 型,直体(V)见图 1(优先采用);

——CB 型,斜体(S);

——CA 型,直体(V)见图 2;

——CA 型,斜体(S)。

这些类型的 CAD 字体的尺寸见表 1。

注:与 CB 型相比,CA 型的字宽减小到 CB 型字宽的 $1/\sqrt{2}$ 。(相当于 GB/T 14691 中的 A 型字)。

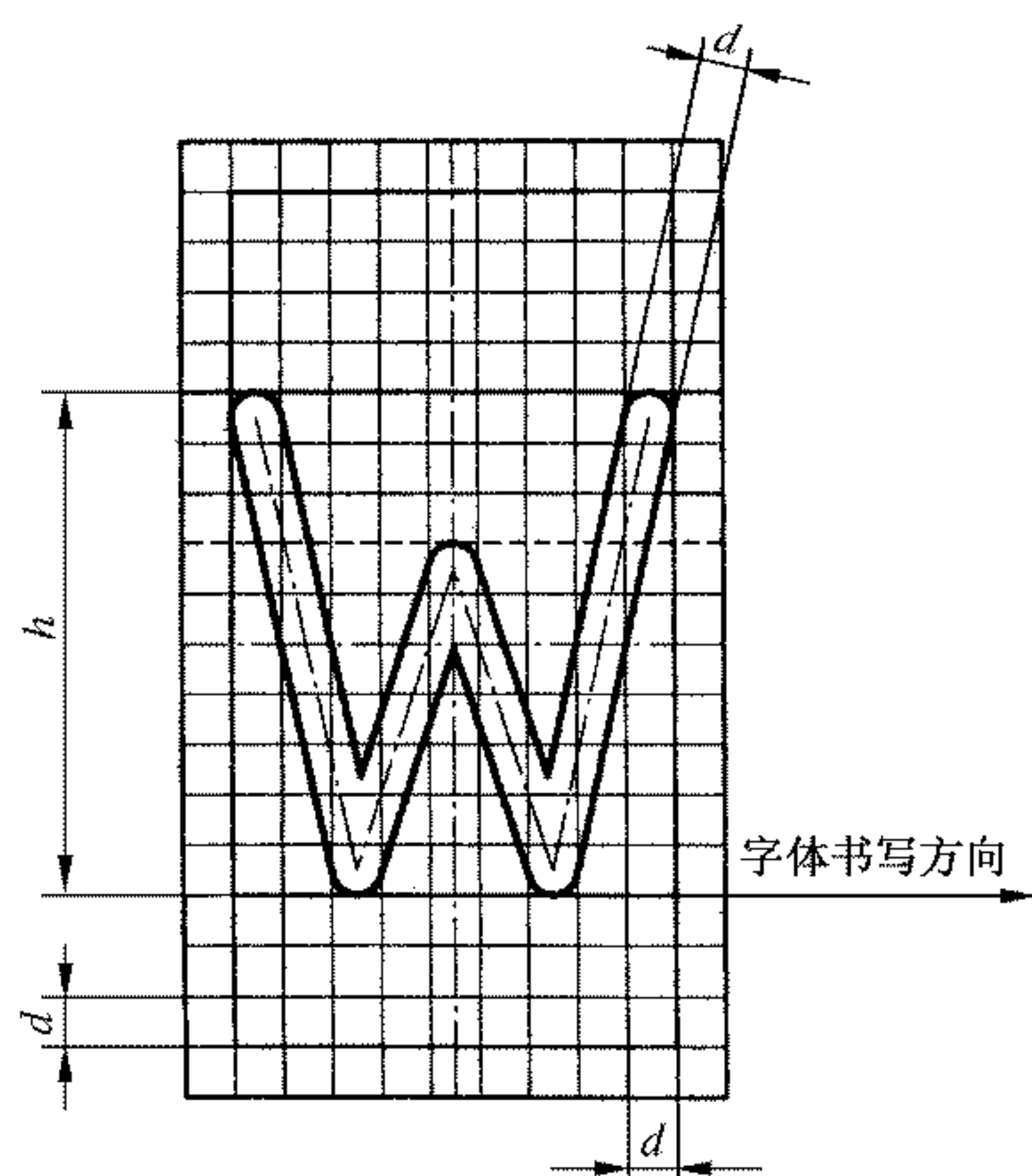


图 1

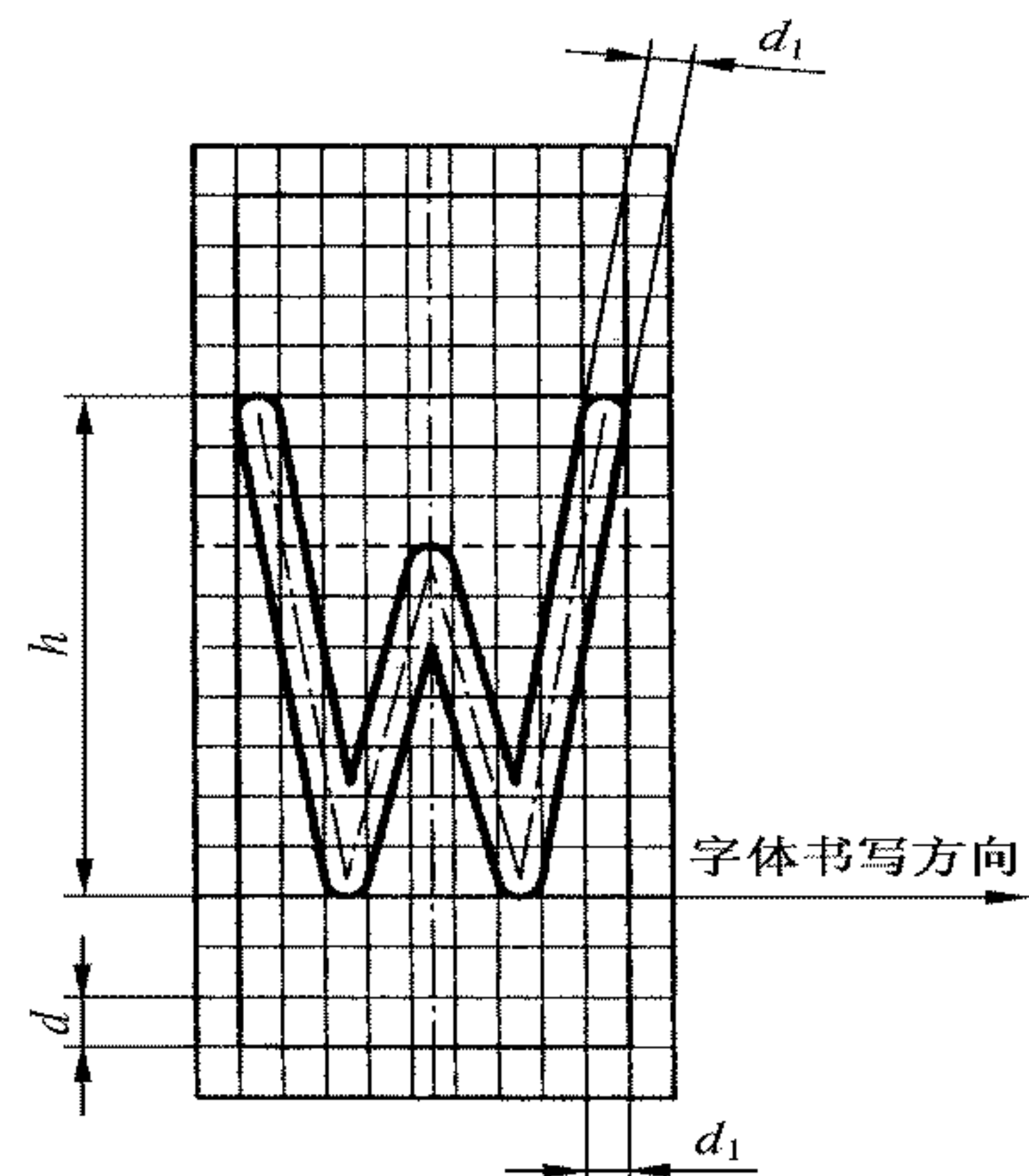


图 2

5.2 字符间隔类型有：

- 等宽间隔(T)见图 3。
- 比例间隔(P)见图 4。

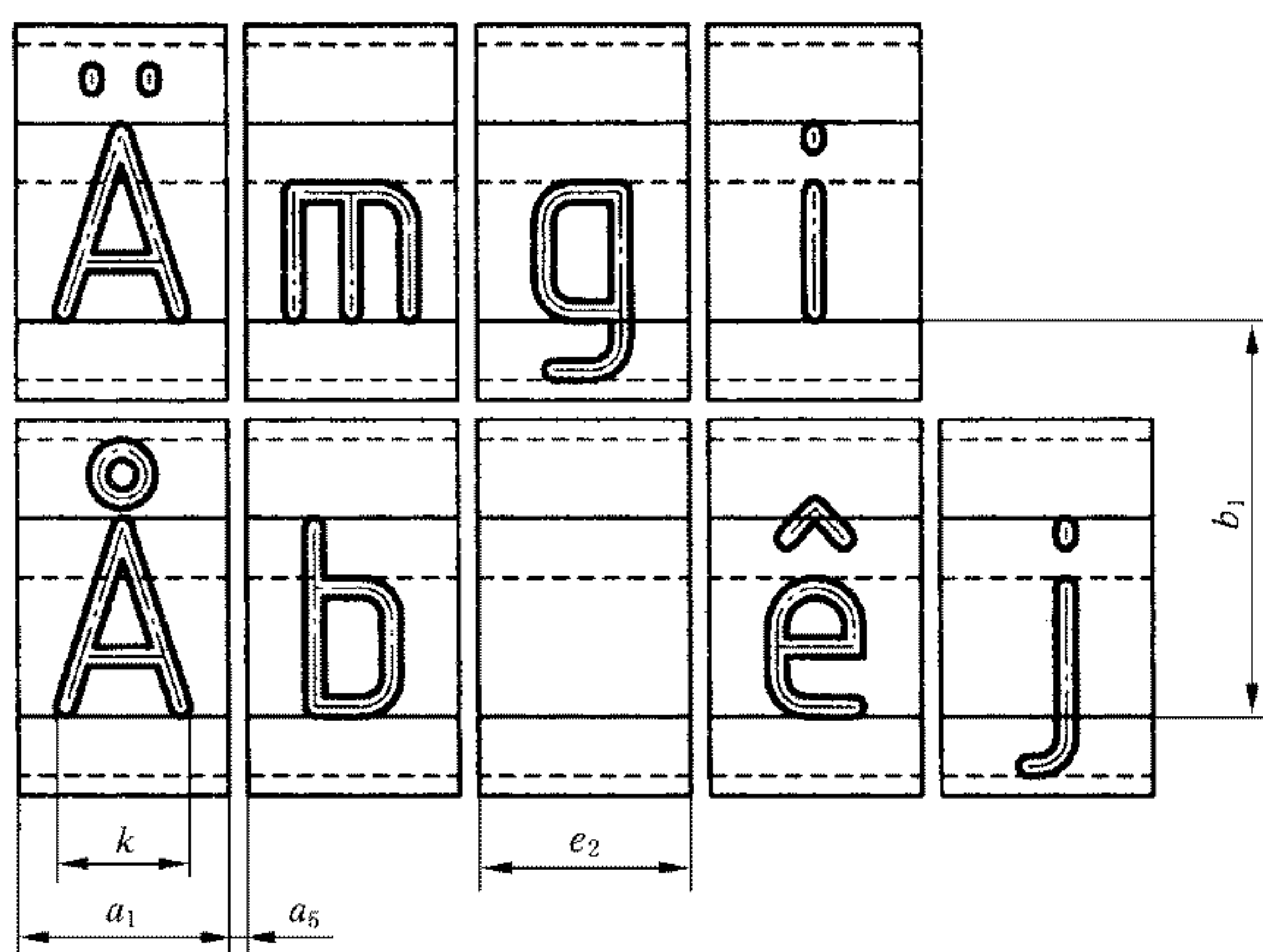


图 3

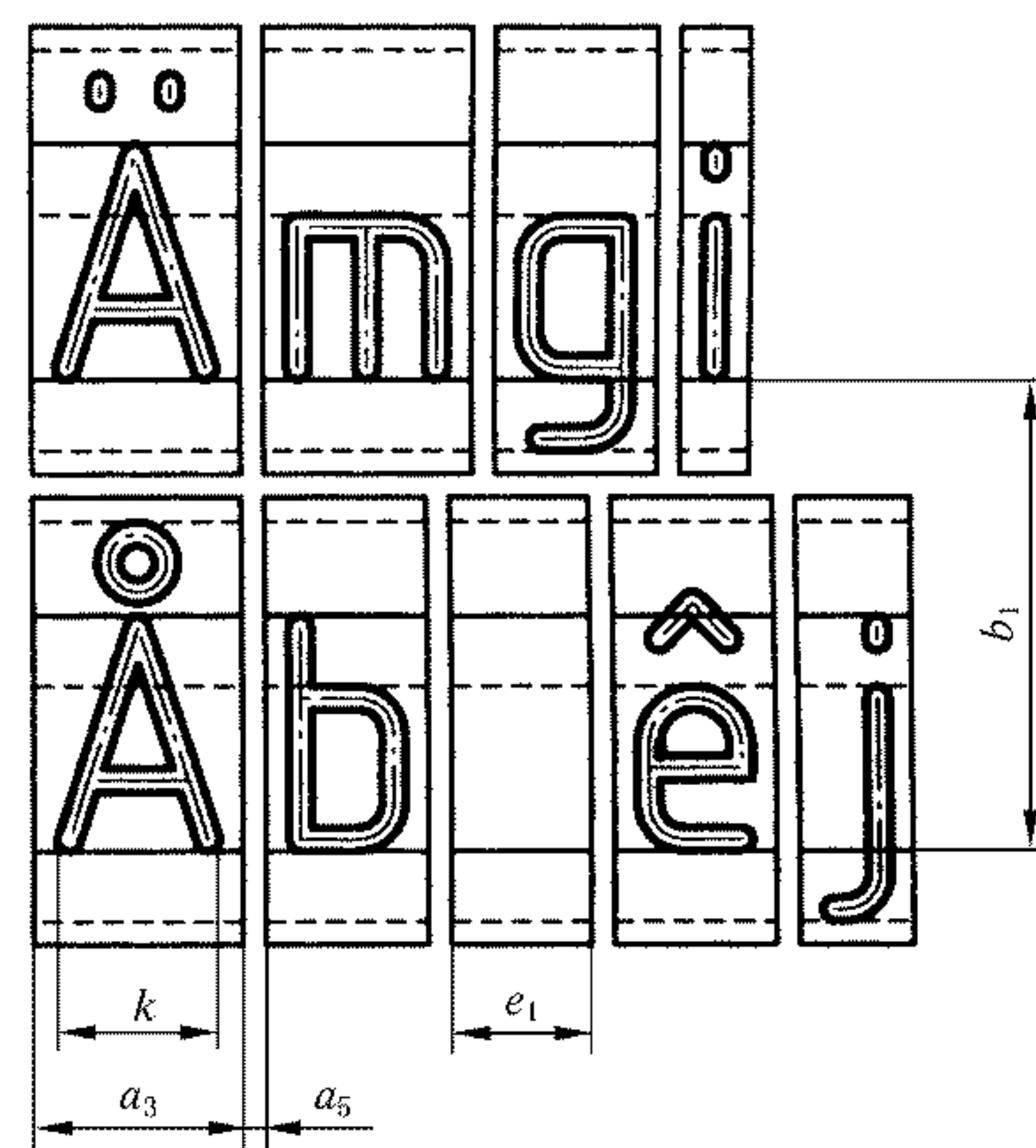


图 4

5.3 矢量字符集的每一字符创建要在字符框内,字符的各元素放置在一栅格系统下,遵守下列规定:

- a) 尺寸大小、形状和位置见图 5 和图 6;
- b) 字符间隔的类型见图 3 和图 4;
- c) 在字符框内对正点见图 7。

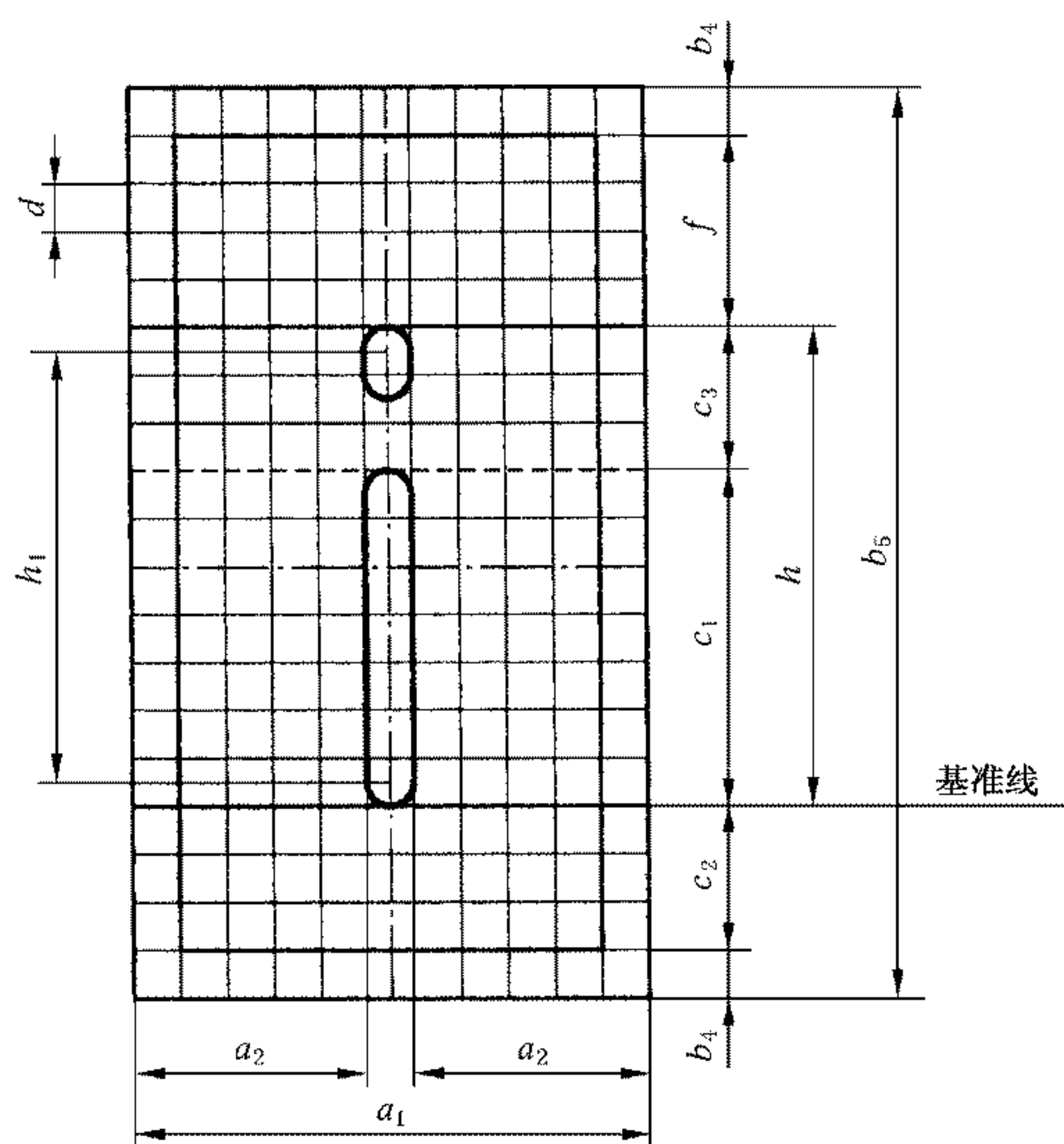


图 5

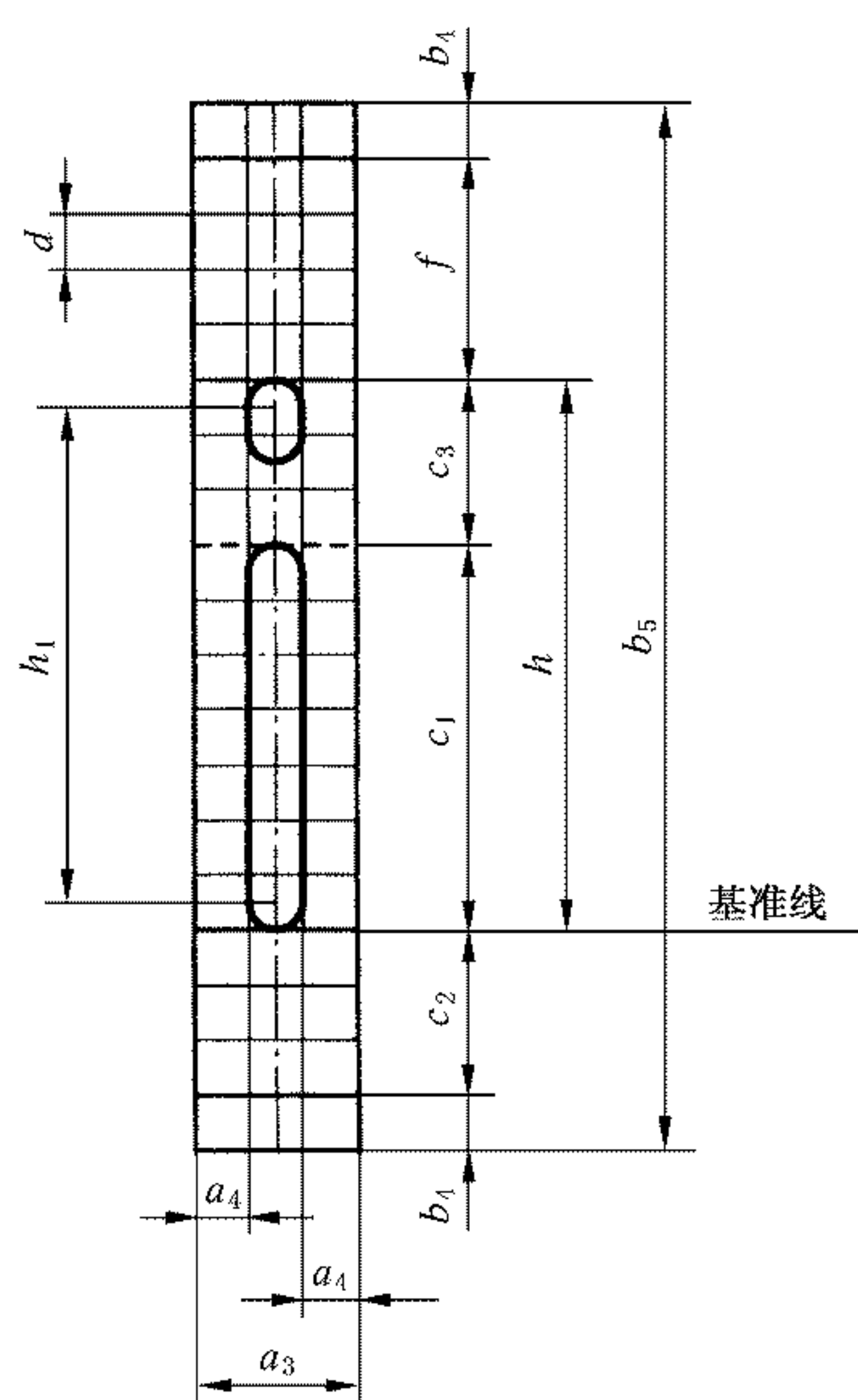


图 6

表 1 CB 和 CA 型字体尺寸 mm

书写格式			基本比例	尺 寸							
字符高度		h	$(10/10)h$	1.8	2.5	3.5	5	7	10	14	20
小写字母高度(x 高度)		c_1	$(7/10)h$	1.26	1.75	2.5 ³⁾	3.5	5 ³⁾	7	10 ³⁾	14
小写字母伸出尾部		c_2	$(3/10)h$	0.54	0.75	1.05	1.5	2.1	3	4.2	6
小写字母伸出头部		c_3									
发音符范围(大写字母)		f	$(4/10)h$	0.72	1	1.4	2	2.8	4	5.6	8
任一字符字宽(CB 型) ¹⁾		k	—	见第 8 章和表 3~表 6							
中心线高度		h_1	$(9/10)h$	1.62	2.25	3.15	4.5	6.3	9	12.6	18
字符框宽度	T	a_1	$(11/10)h$	1.98	2.75	3.85	5.5	7.7	11	15.4	22
	P	a_3	$[(2/10)h]+k$	见第 8 章和表 3~表 6							
基线间距 ²⁾		b_1	$(19/10)h$	3.42	4.75	6.65	9.5	13.3	19	26.6	38
字符框高度		b_5	$(19/10)h$								
字符框与字符沿水平方向间隔 (CB 型) ¹⁾	T	a_2	$(a_1-k)/2$	见第 8 章和表 3~表 6							
	P	a_4	$(1/10)h$	0.18	0.25	0.35	0.5	0.7	1	1.4	2
字符框与字符沿垂直方向间隔		b_4	$(1/10)h$								
笔画宽度	CB 型	d	$(1/10)h$								
	CA 型	d_1	$(1/14)h$	0.13 ³⁾	0.18 ³⁾	0.25	0.35	0.5	0.7 ³⁾	1	1.4 ³⁾
字间隔(CB 型) ¹⁾	P	e_1	$(6/10)h$	1.08	1.5	2.1	3	4.2	6	8.4	12
	T	e_2	$(11/10)h$	1.98	2.75	3.85	5.5	7.7	11	15.4	22
字符框间隔		a_5	≥ 0	—							
1) 在 CA 型中, k 、 a_1 、 a_3 、 a_2 、 a_4 、 e_1 和 e_2 均按 CB 型值的 $1/\sqrt{2}$ 计算。 2) 用于带发音符的大写、小写字母,当间距为 b_2 和 b_3 时,见 GB/T 14691—1993 表 2。 3) 取圆整值。											

6 对正

每一个字符、每一行和每一段落都应有一个对正点。
对正点的位置和标识码见表 2 和图 7、图 8。
如数字用十进制格式书写,要以小数点对正,见图 9。

表 2 对正点的标识

方向		水 平		
		左	中	右
垂直	顶	1	4	7
	中	2	5	8
	底	3	6	9

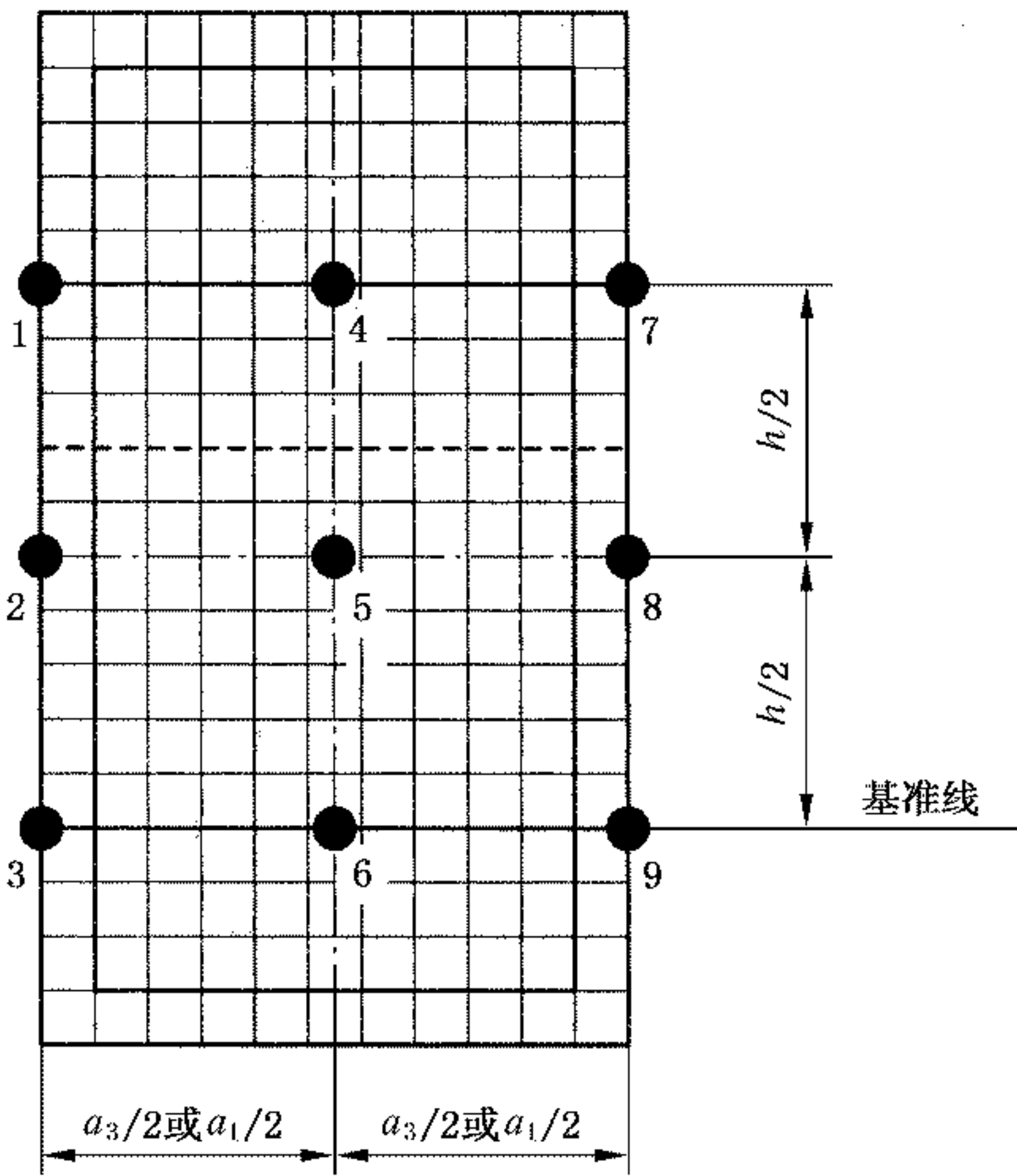


图 7

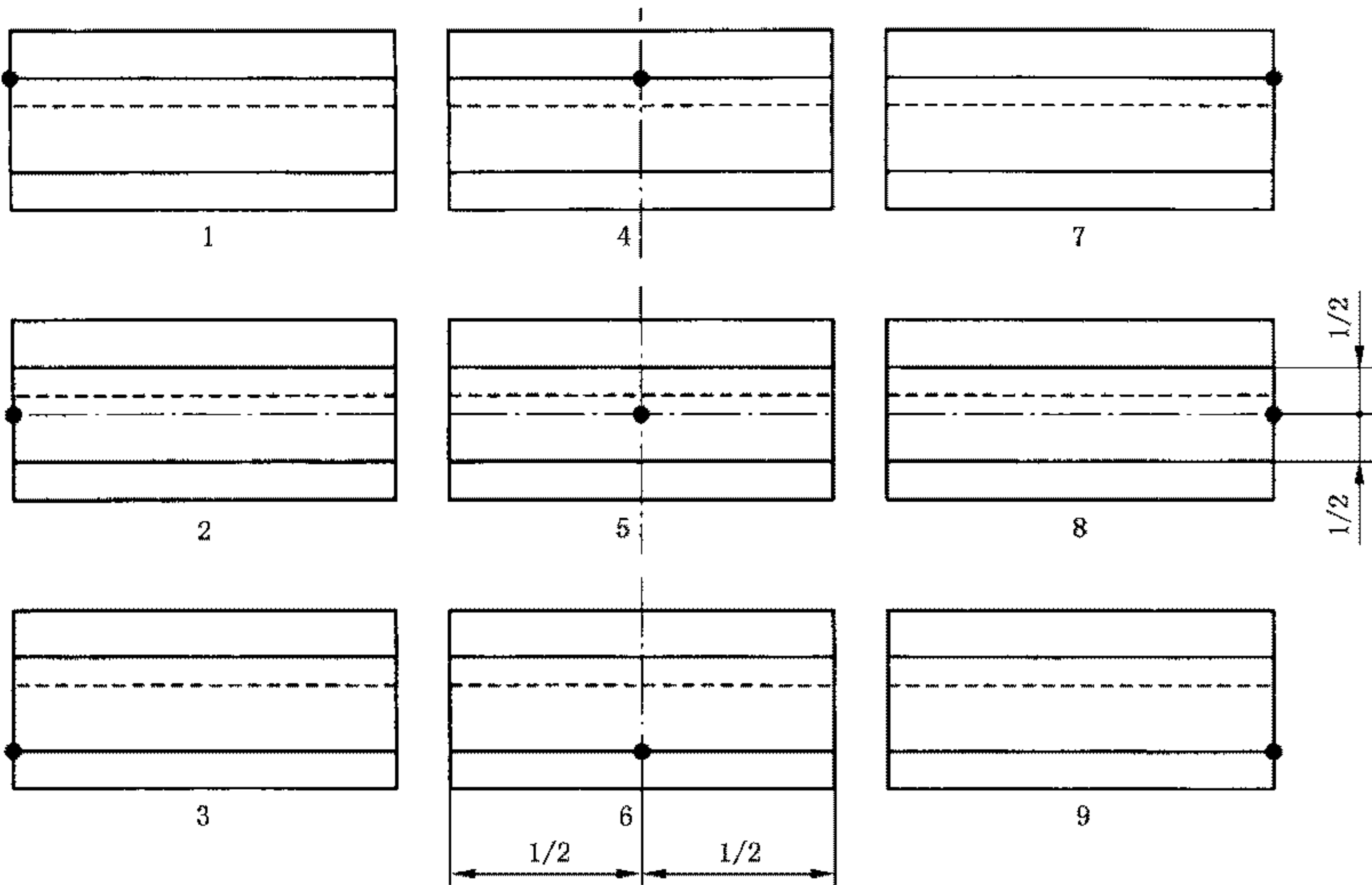


图 8

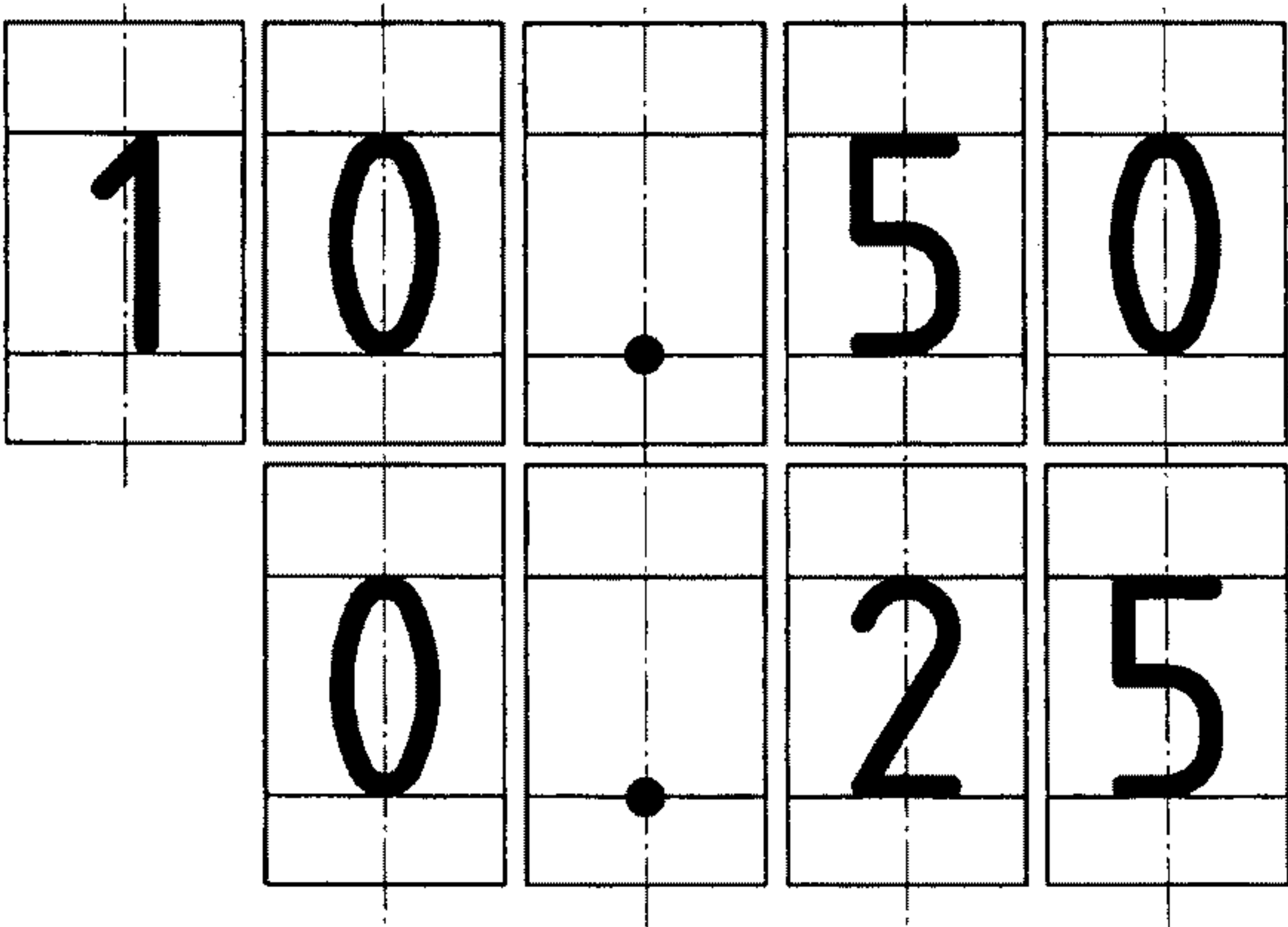


图 9

段落文字可采用左对正,中对正或右对正,见图 10。整个段落区域的对正点见图 11。

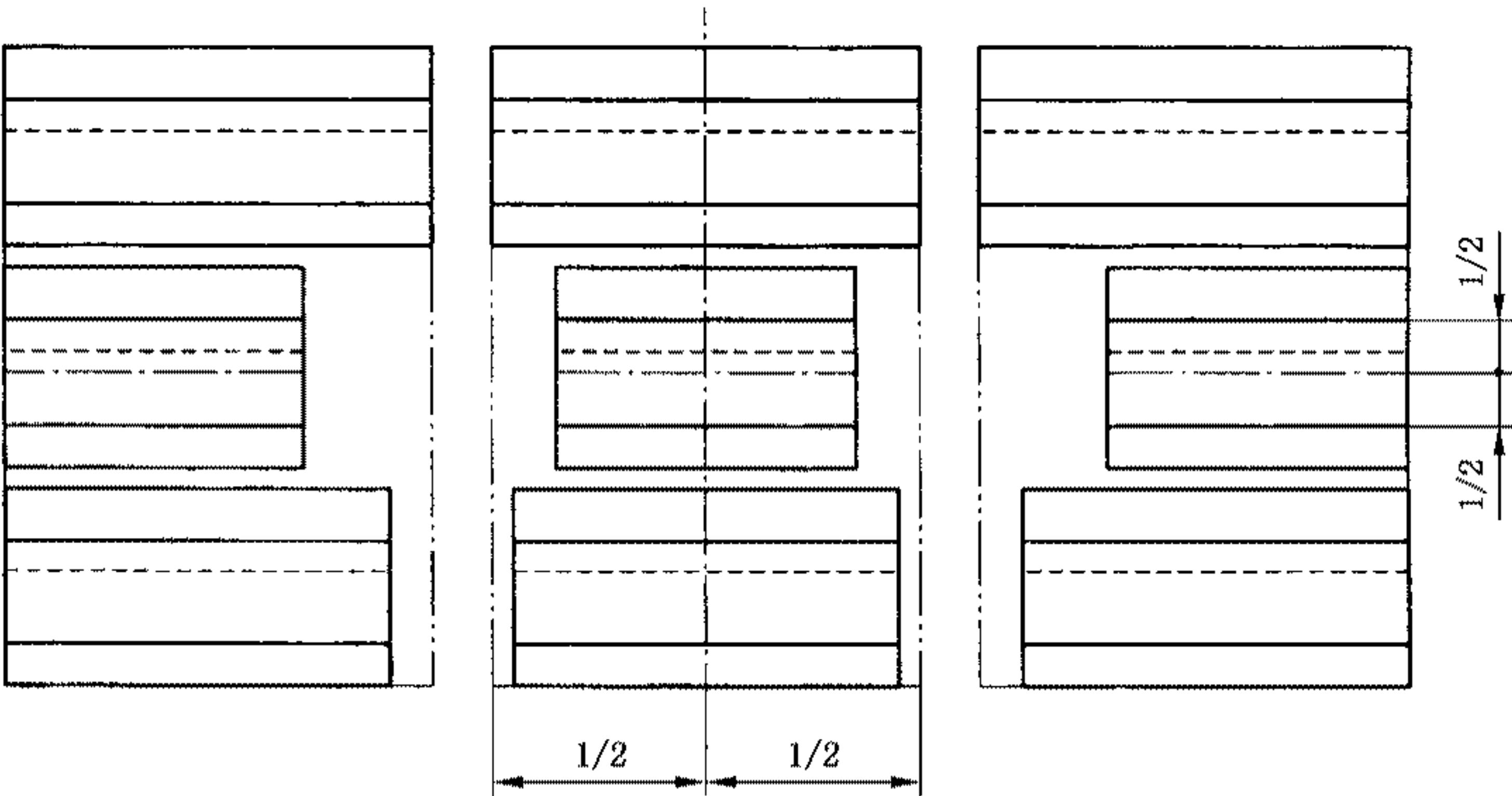


图 10

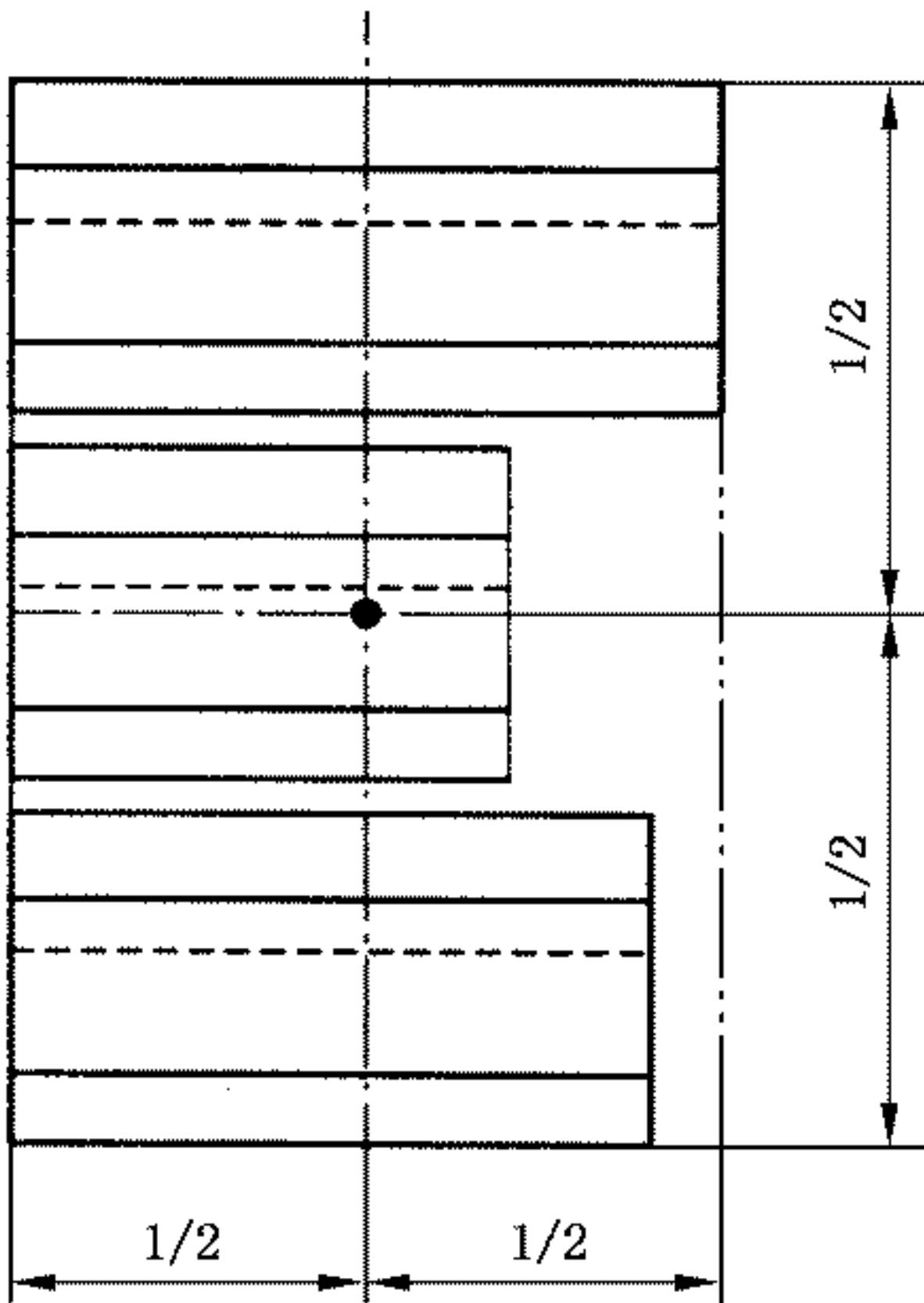


图 11

7 标记

CAD 字型应采用 GB/T 14691 规定的标记。

例:CB 字型,比例间隔,直体,拉丁字母,3.5 mm 字高

标记为:字体 GB/T 14691-CB PVL—3.5

8 字符形状

在表 3~表 6 中所列 CB 字母用一假想栅格定位,以表明其位置和比例关系。
例:画在假想栅格中的一个字母见图 12。

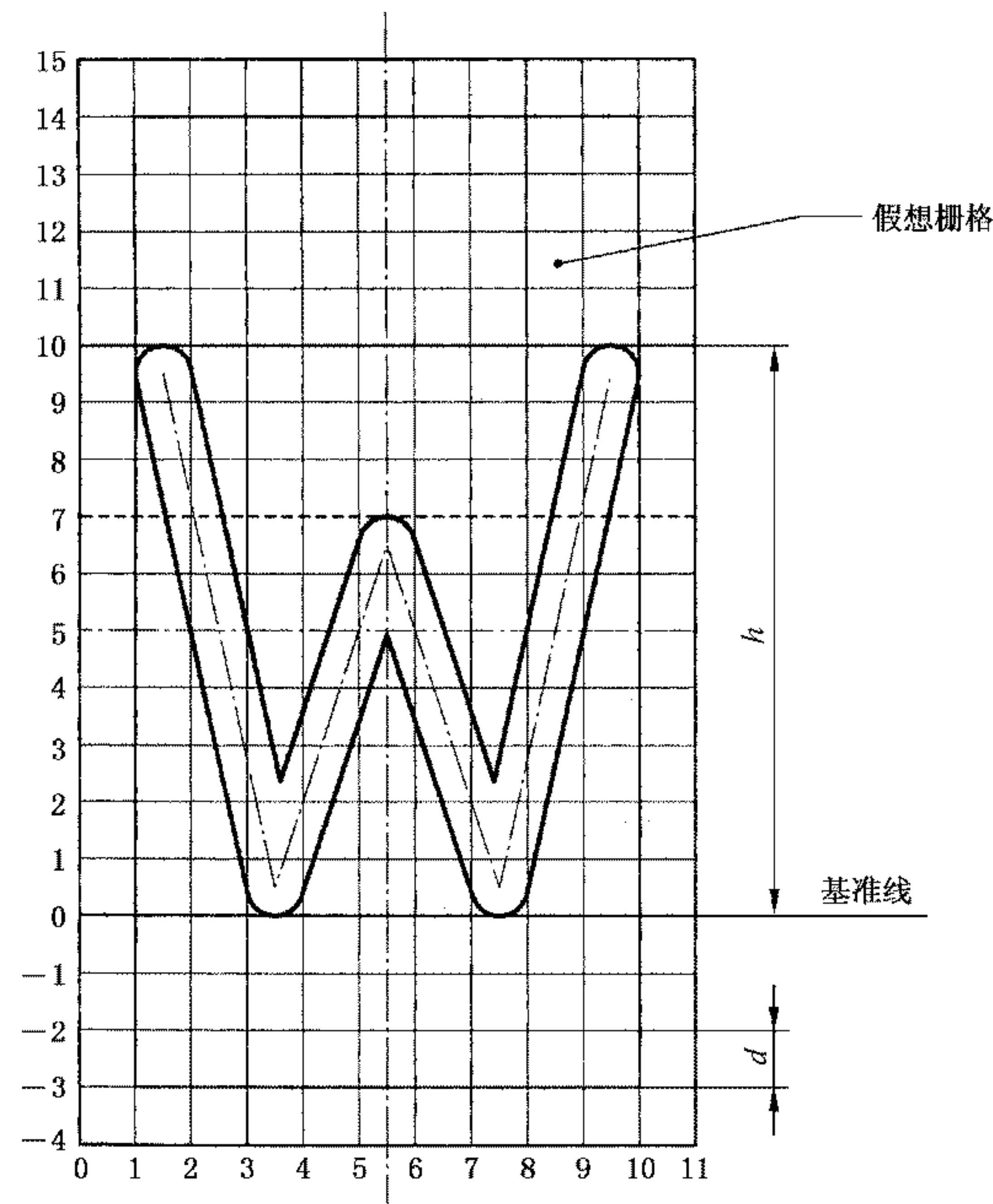


图 12

对表 3~表 6 中所表示的字母说明如下:

a) 在斜杠前的数值表示字母类型

- | | | |
|---------|-----------|-----------|
| 00/... | 到 100/... | 大写字母(表 3) |
| 101/... | 到 200/... | 小写字母(表 4) |
| 201/... | 到 300/... | 数字(表 5) |
| 301/... | 到 400/... | 符号(表 6) |

b) 在斜杠后的数值表示字母的发音符号

- | | |
|--------------|-------------|
| .../00:无发音符号 | .../10:长音符 |
| .../01:浊音符 | .../11:点 |
| .../02:清音符 | .../12:发嘶音 |
| .../03:高低音符 | .../13:斜杠 |
| .../04:鼻音符 | .../14:连字符 |
| .../05:分音符 | .../15:短杆 |
| .../06:小圈 | .../16:带 η |
| .../07:双清音符 | .../17:双元音 |
| .../08:撞击音 | .../18:特殊字符 |
| .../09:短音符 | |

表 3 大写字母及发音符号

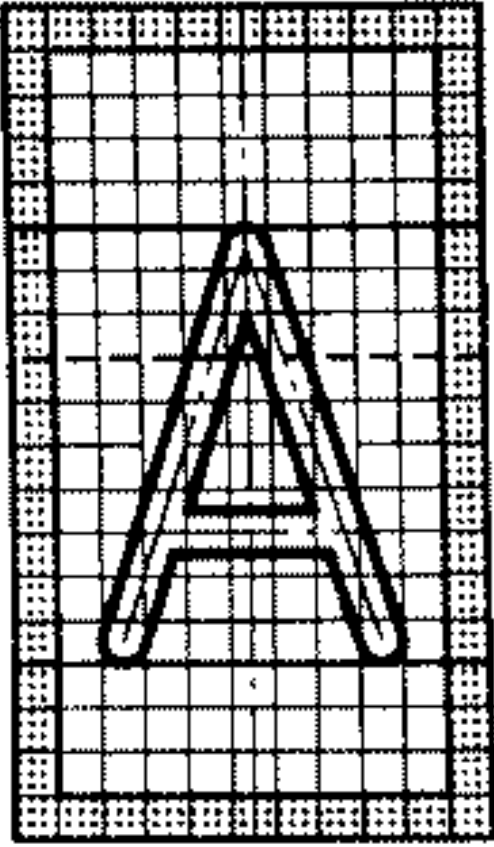
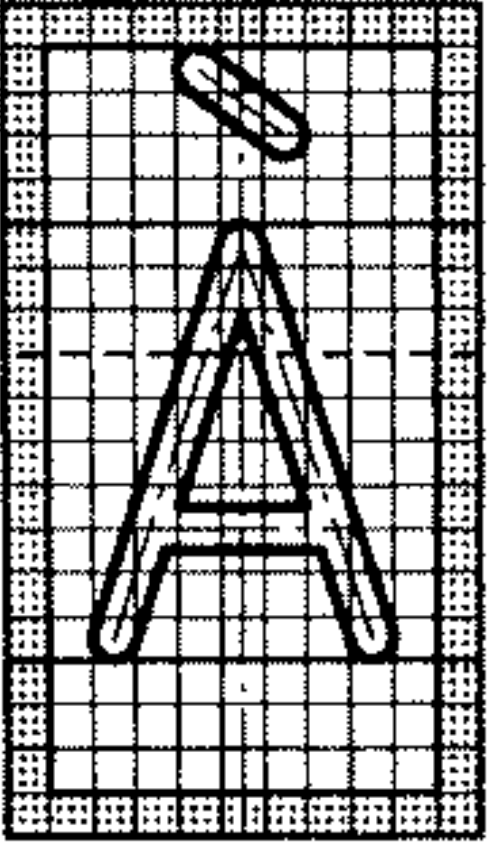
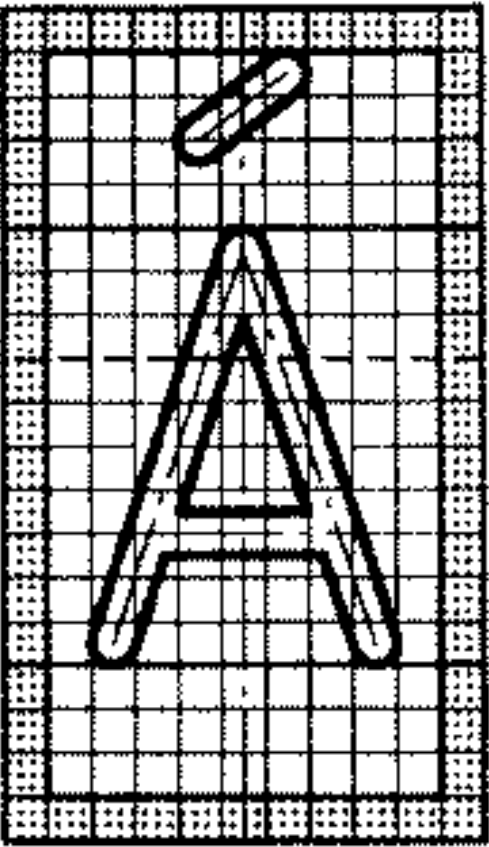
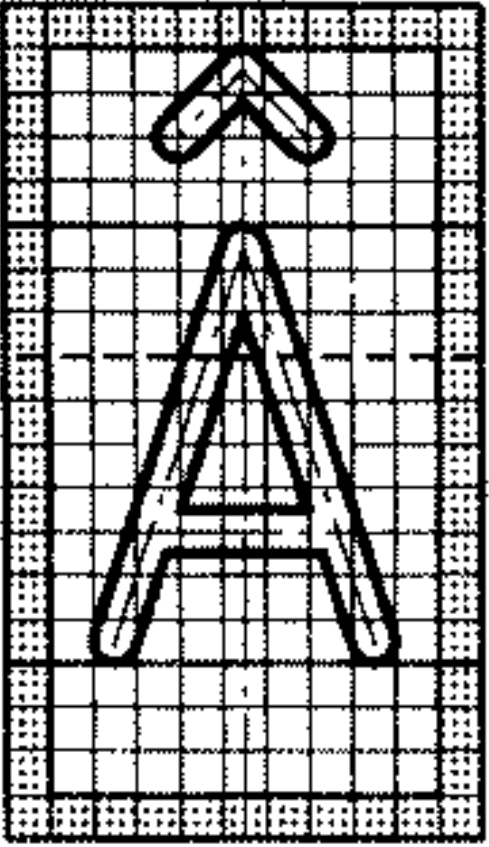
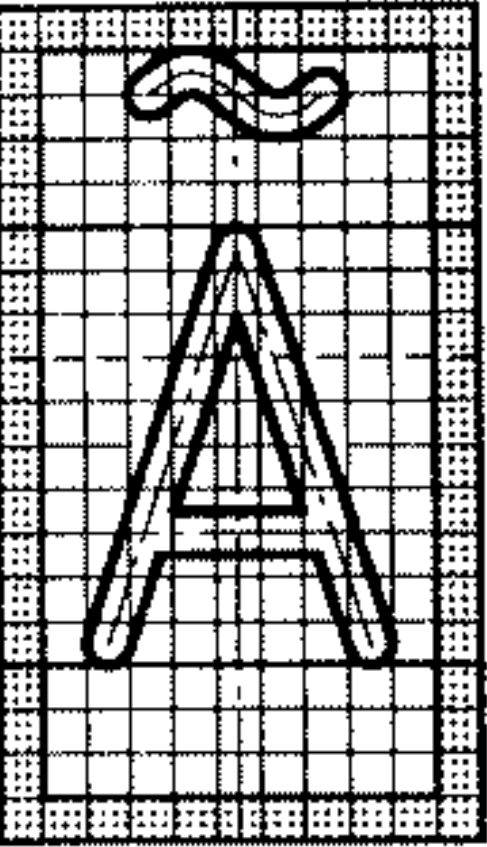
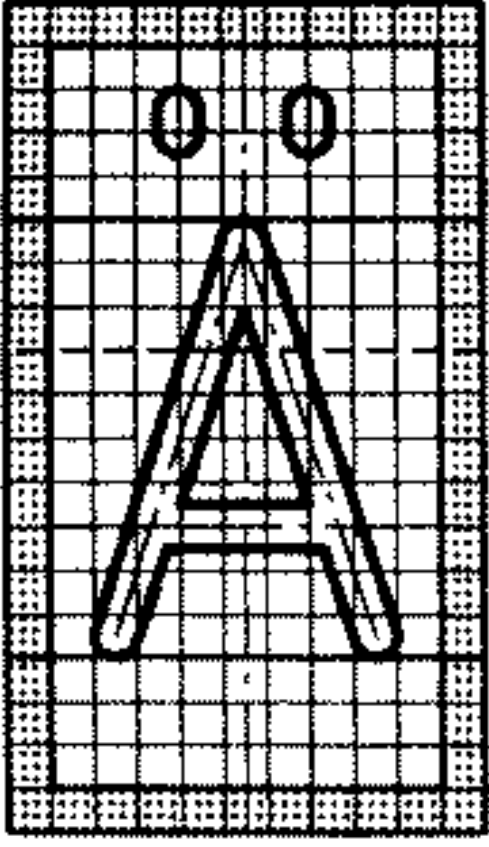
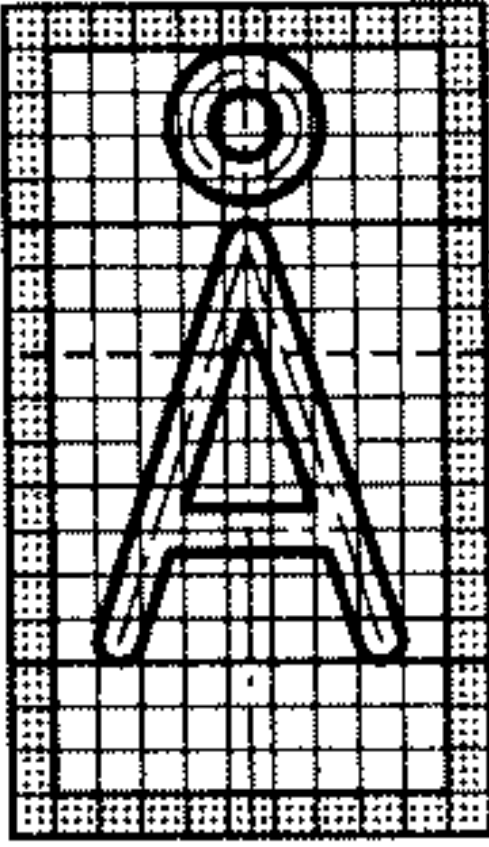
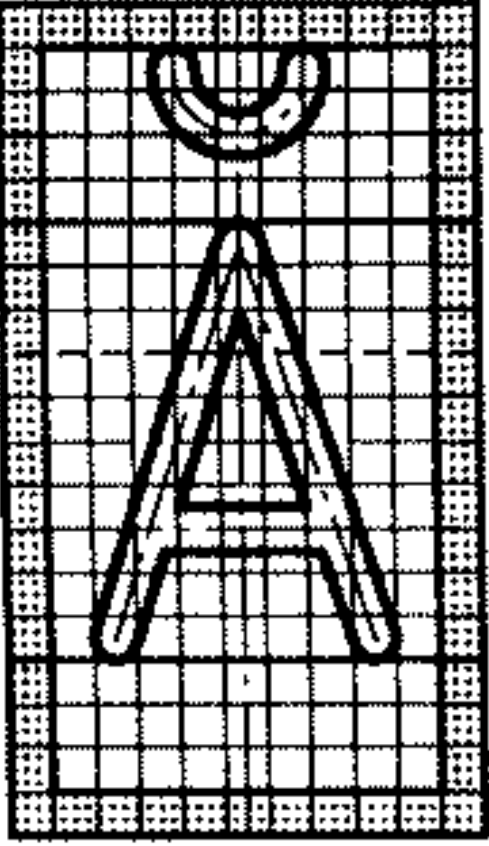
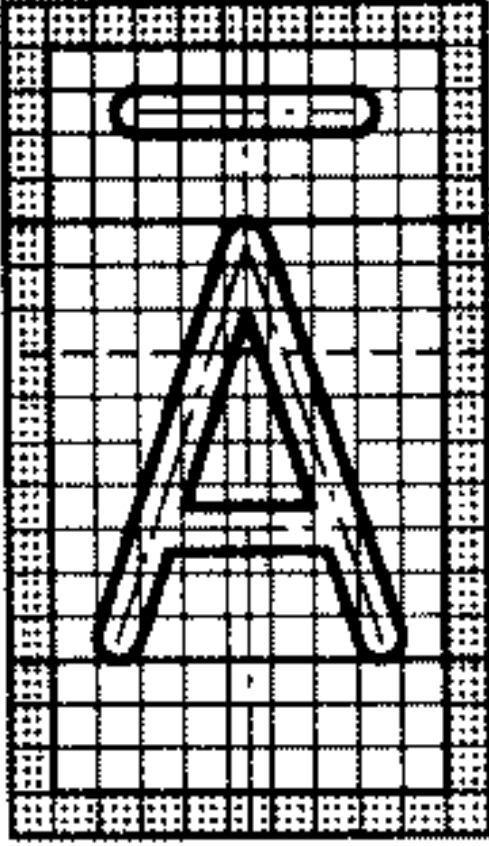
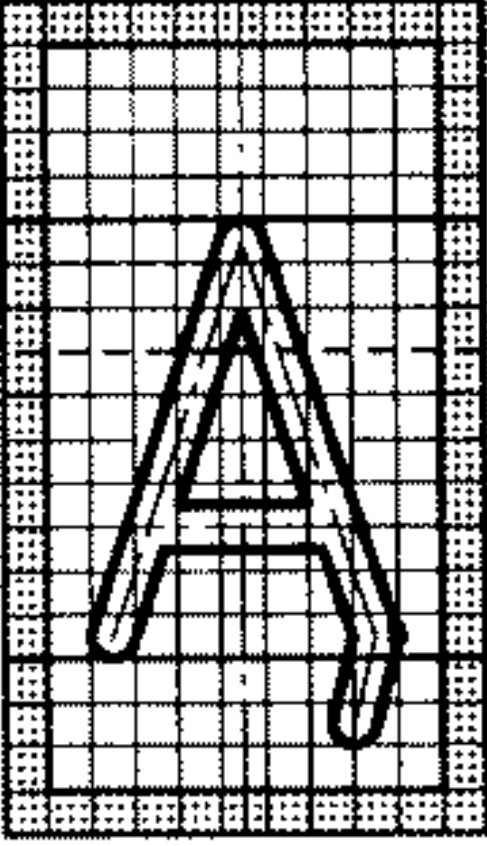
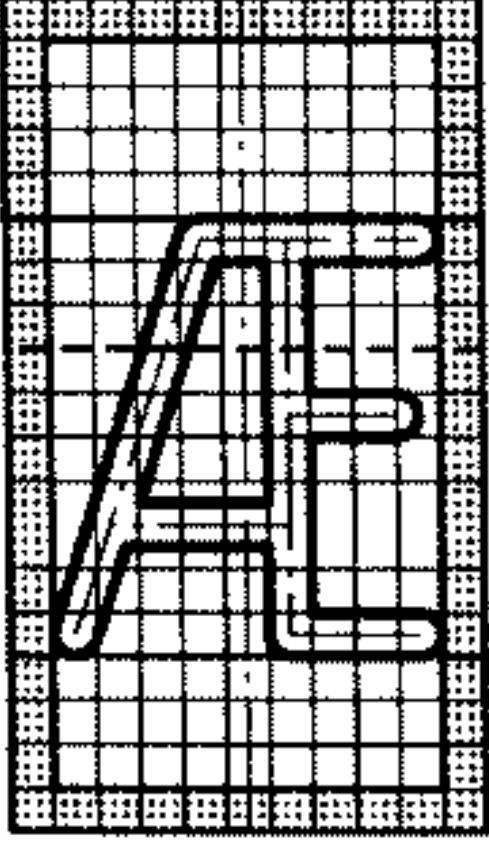
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	 001/09	 001/10		 001/12
	 001/17			

表 3 (续)

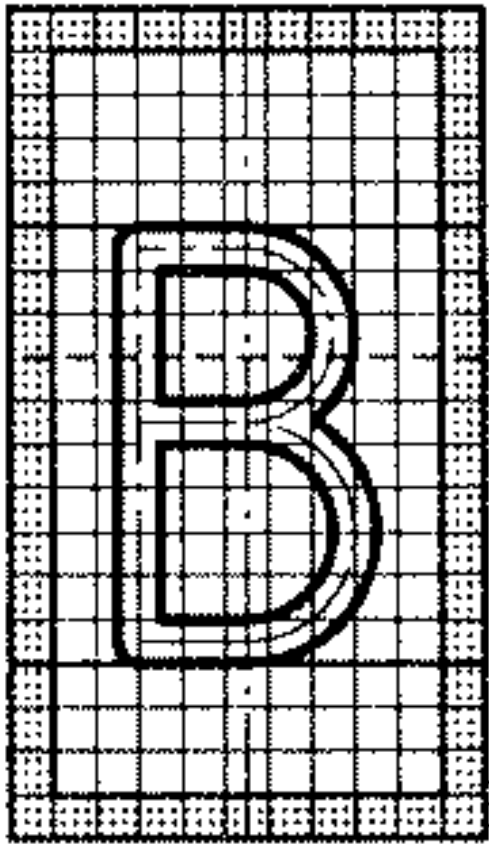
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表 3 (续)

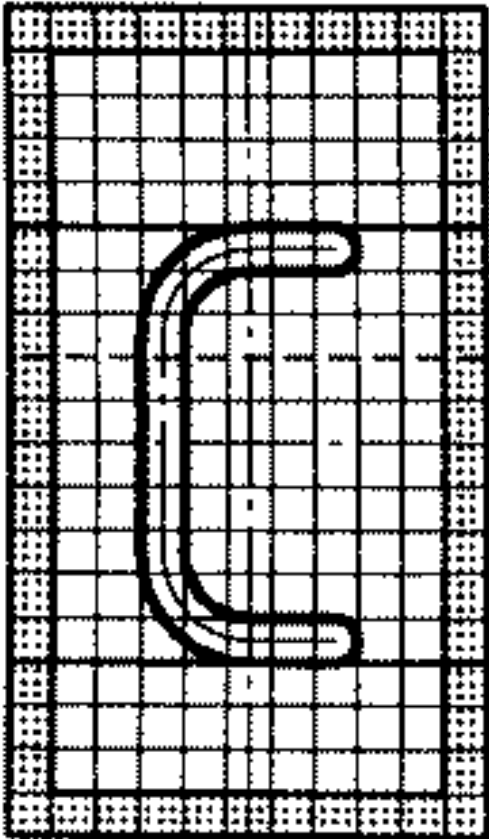
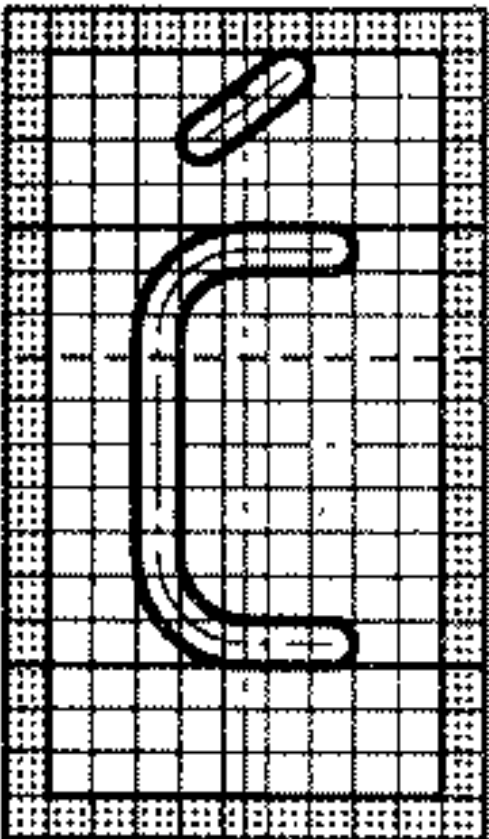
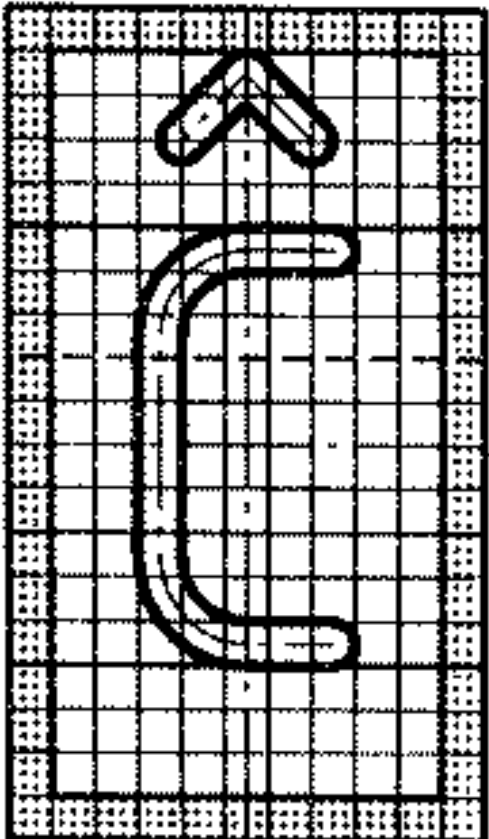
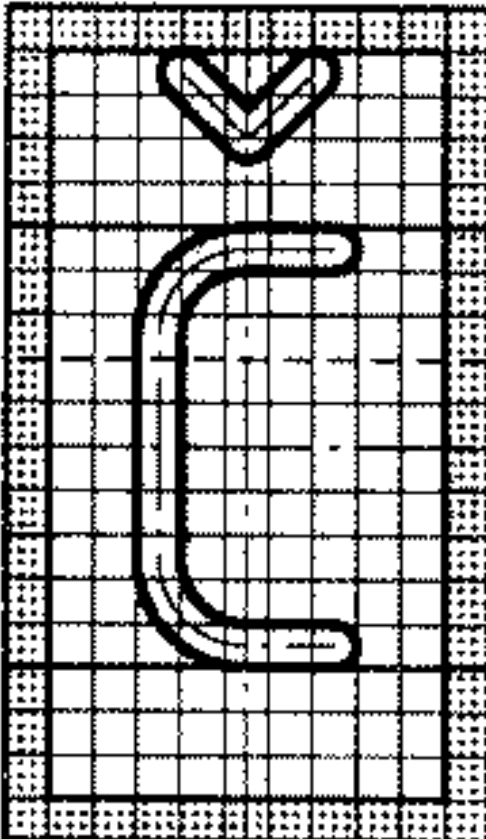
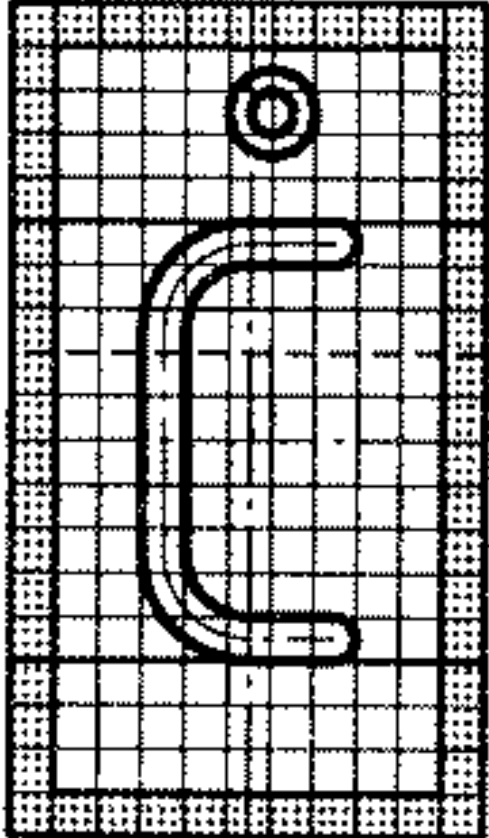
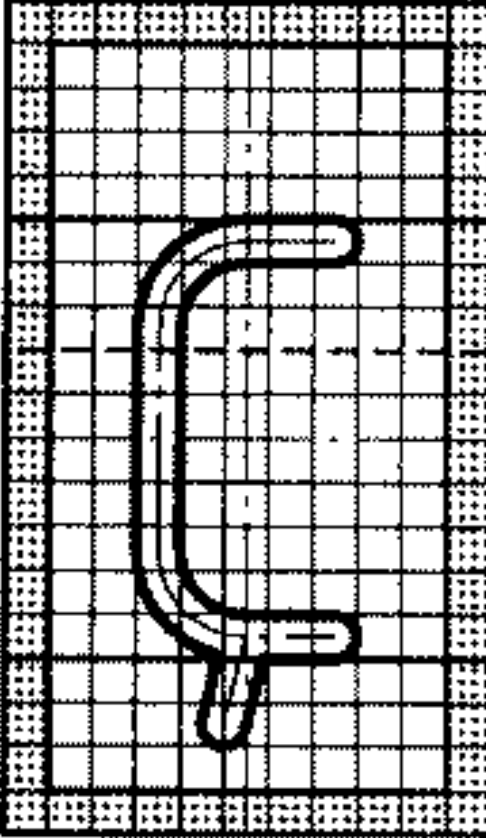
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表 3 (续)

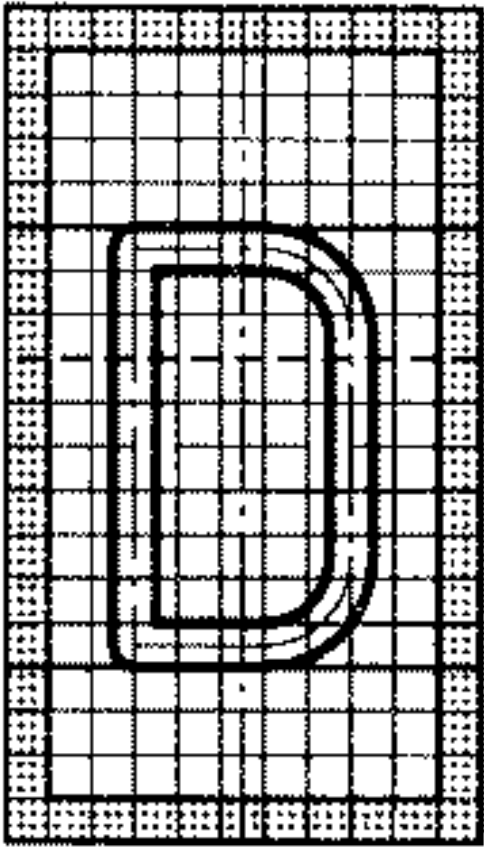
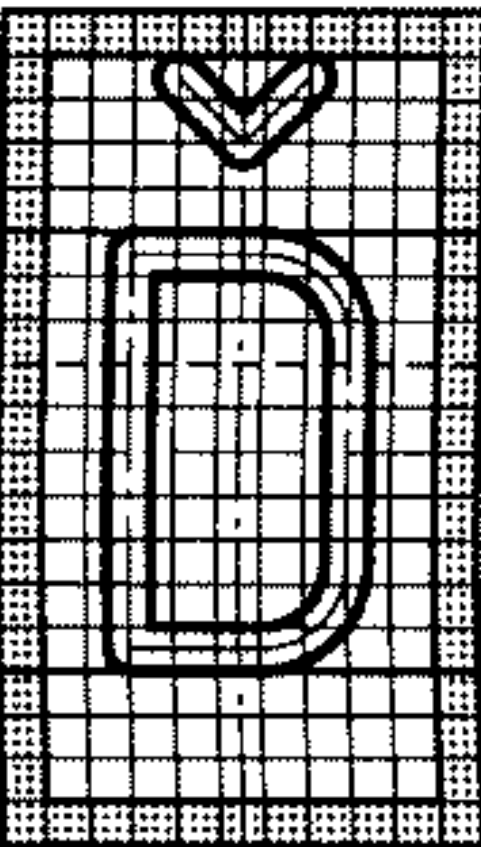
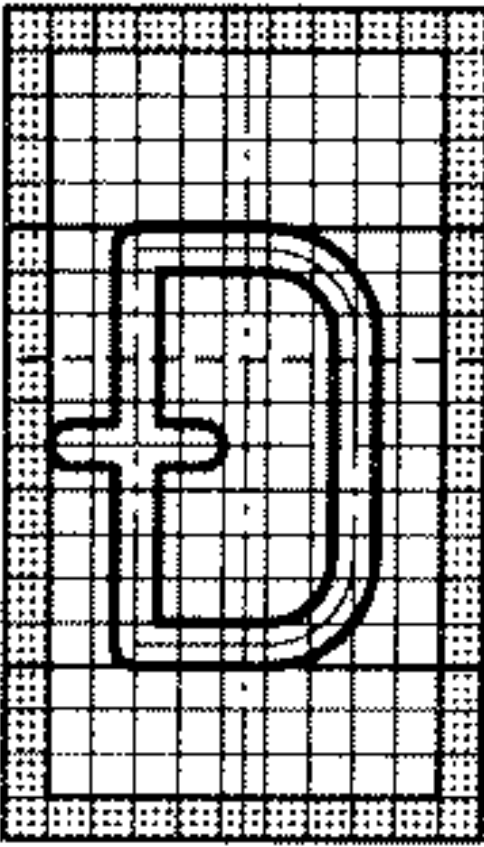
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表 3 (续)

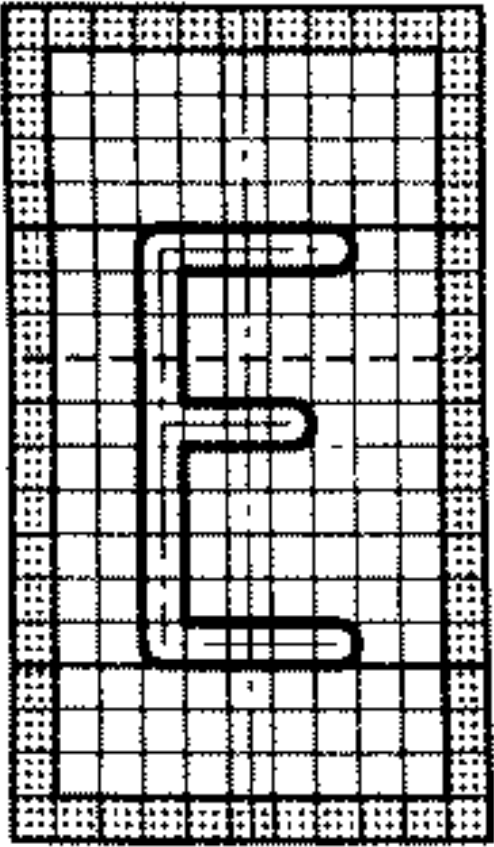
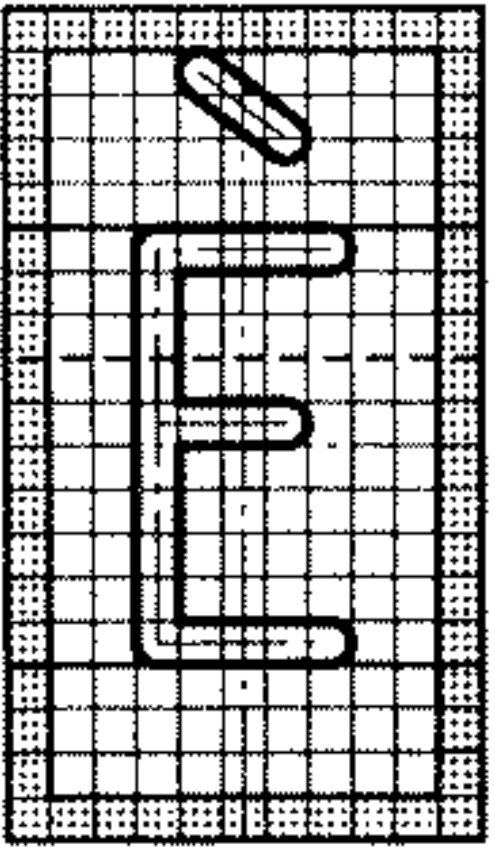
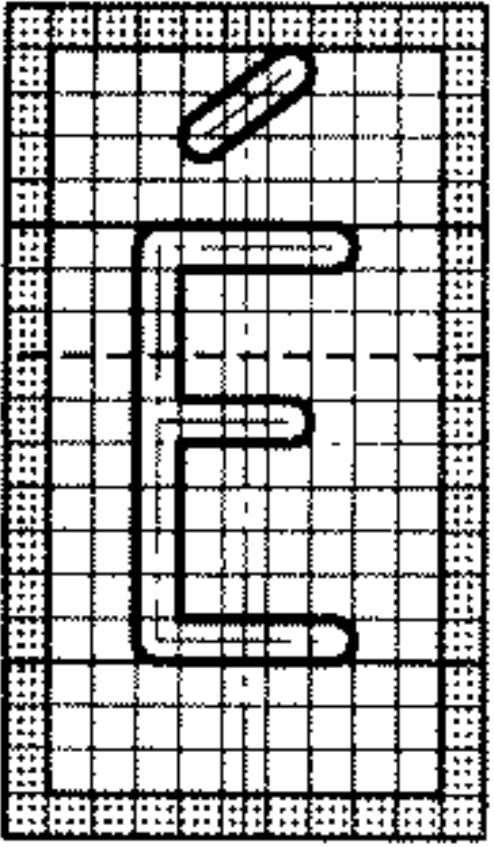
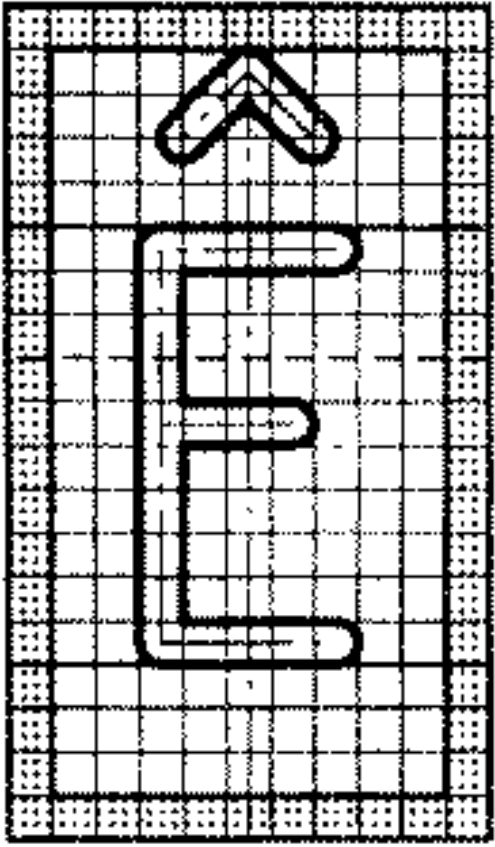
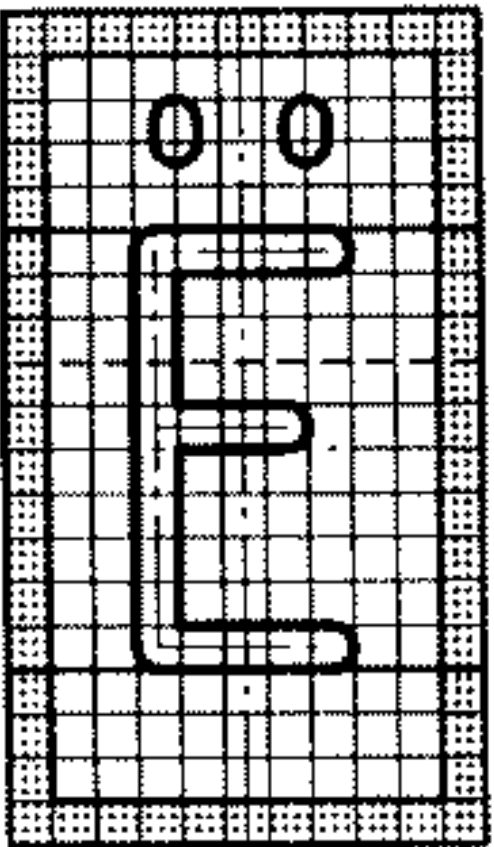
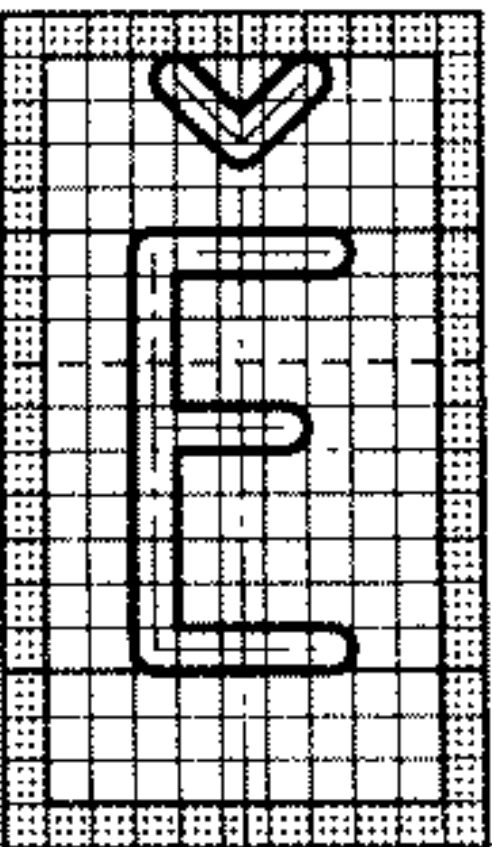
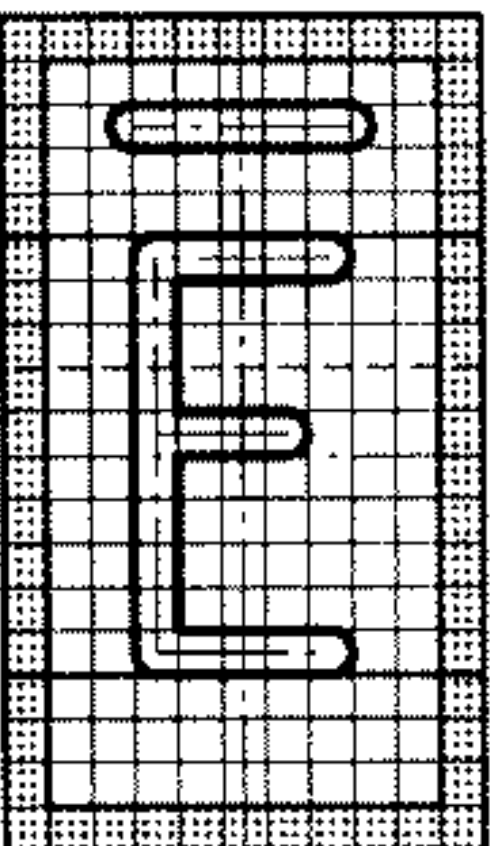
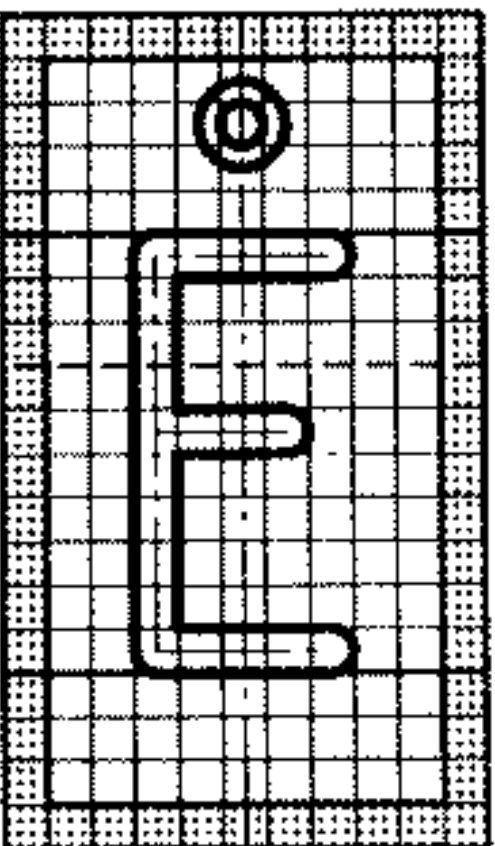
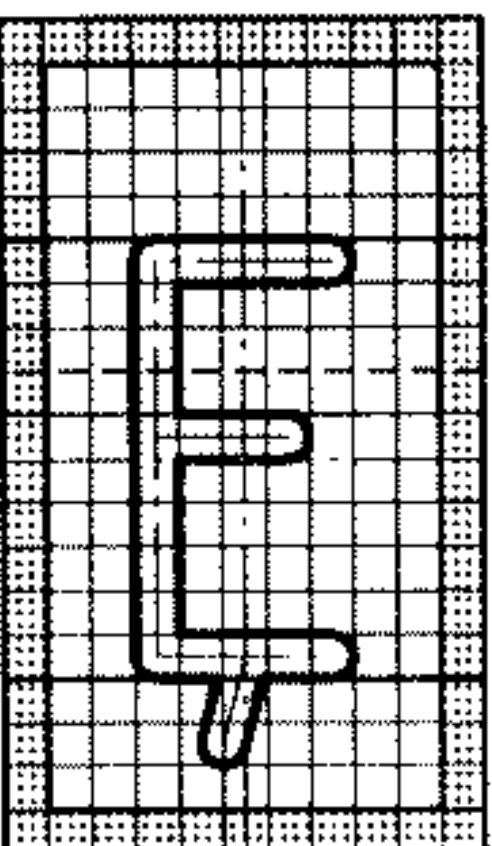
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表 3 (续)

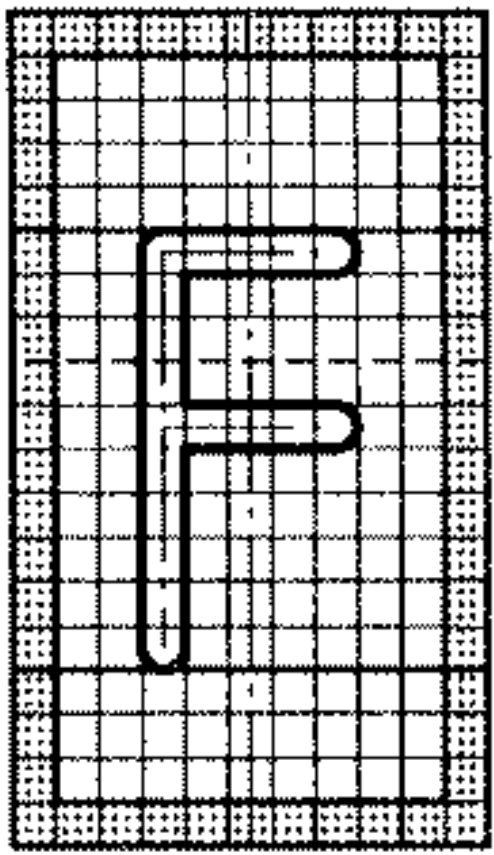
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表 3 (续)

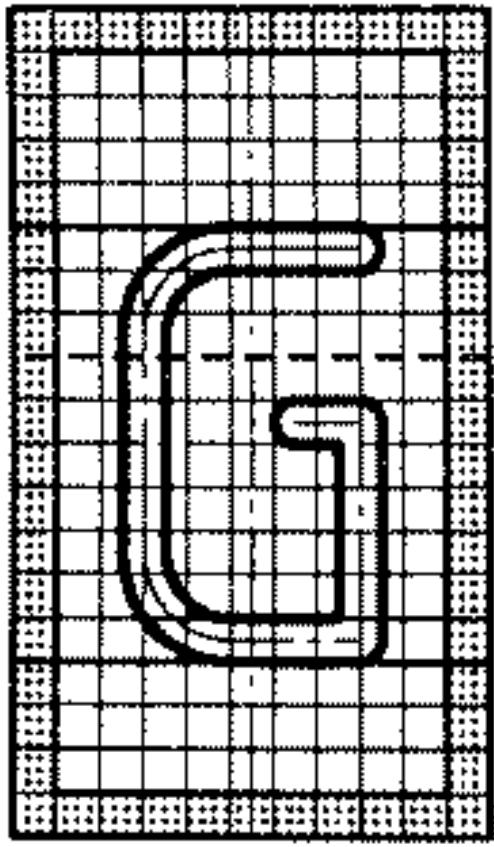
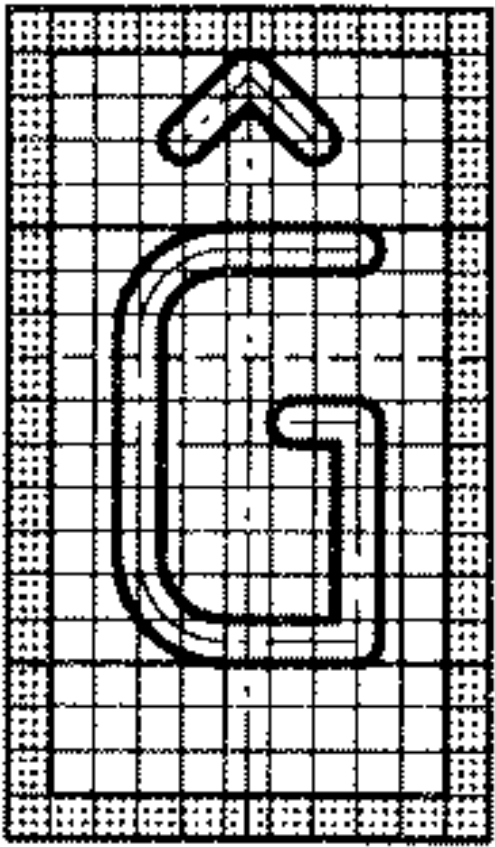
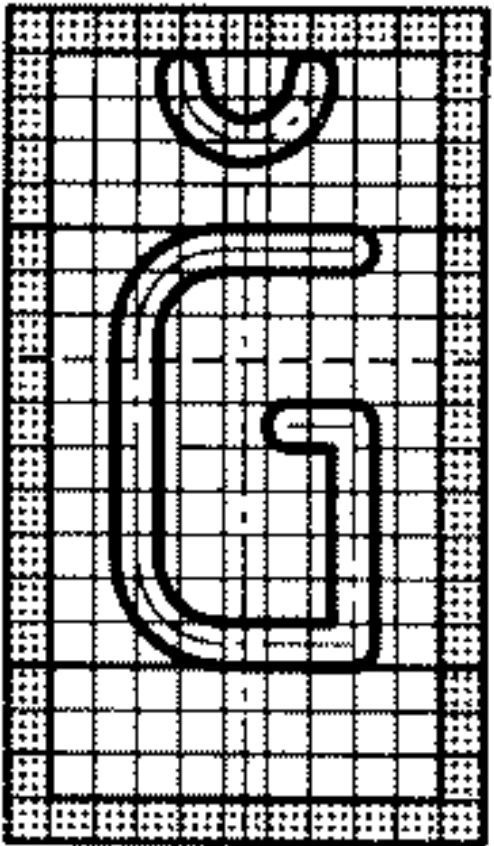
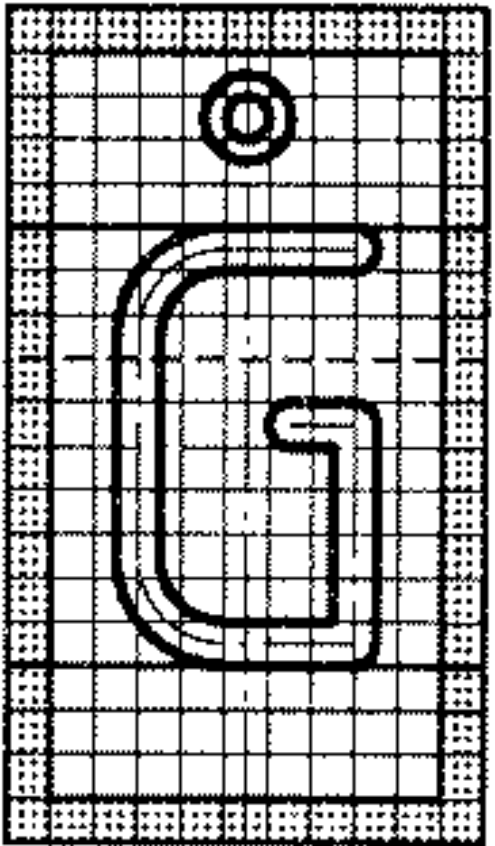
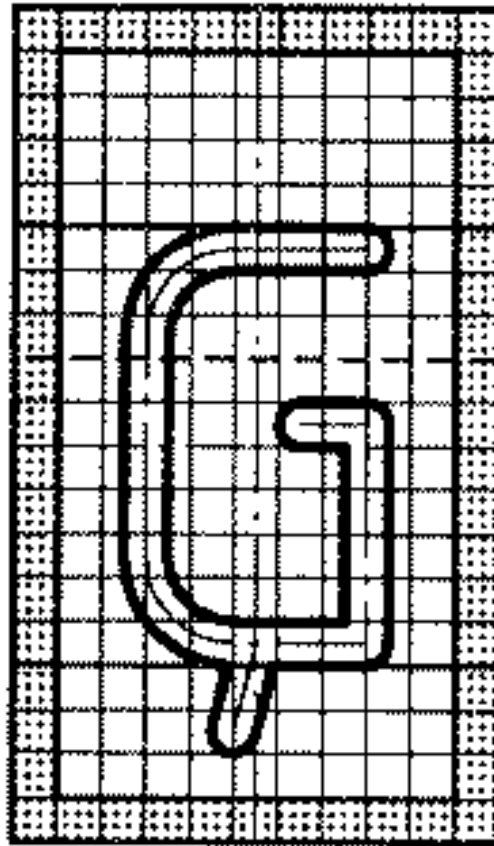
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	 007/09		 007/11	 007/12

表 3 (续)

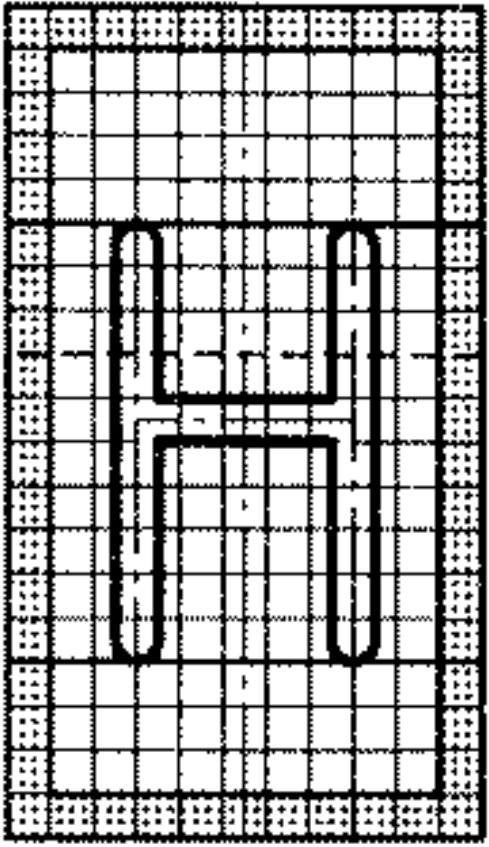
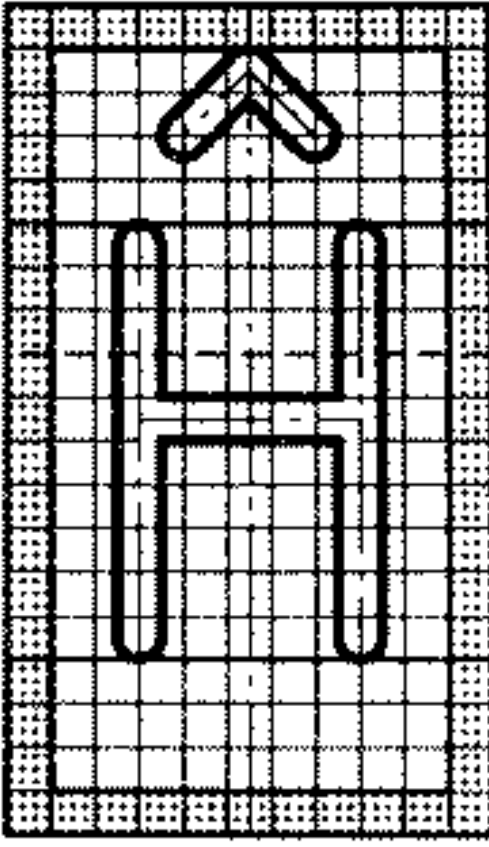
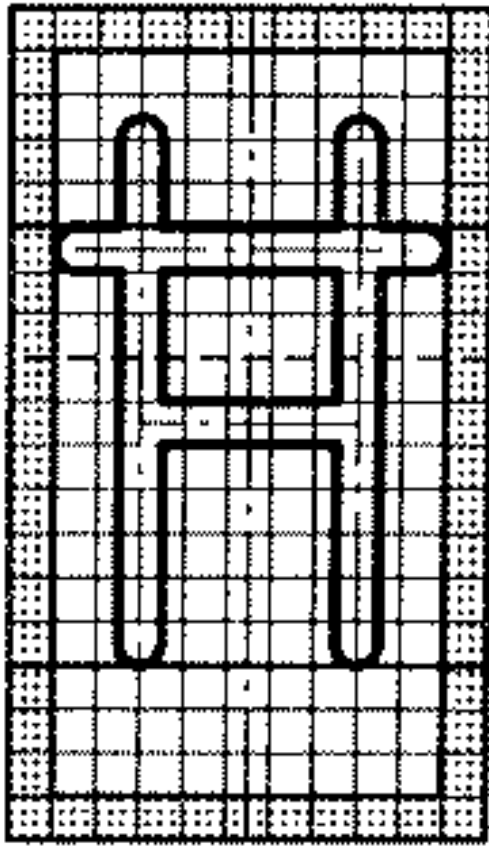
 008/00			 008/03	
			 008/15	

表 3 (续)

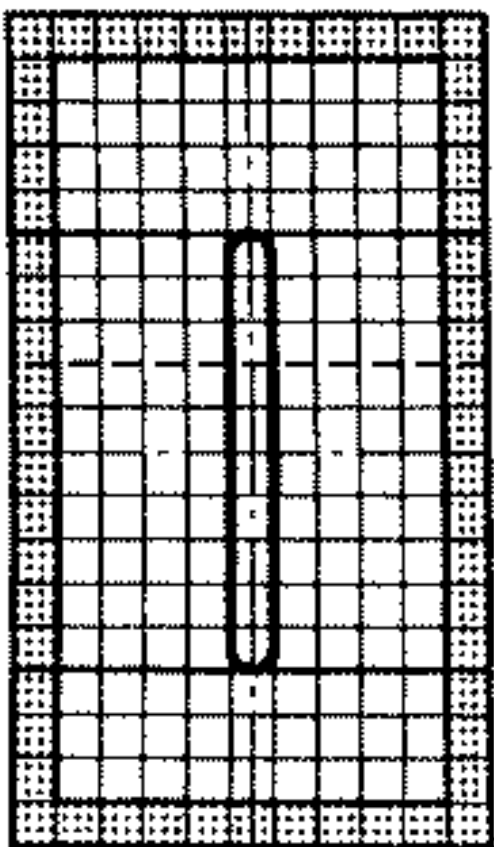
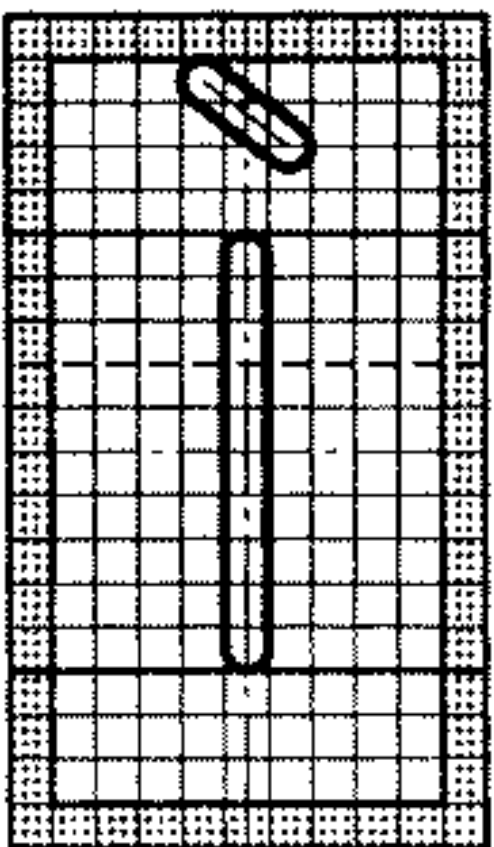
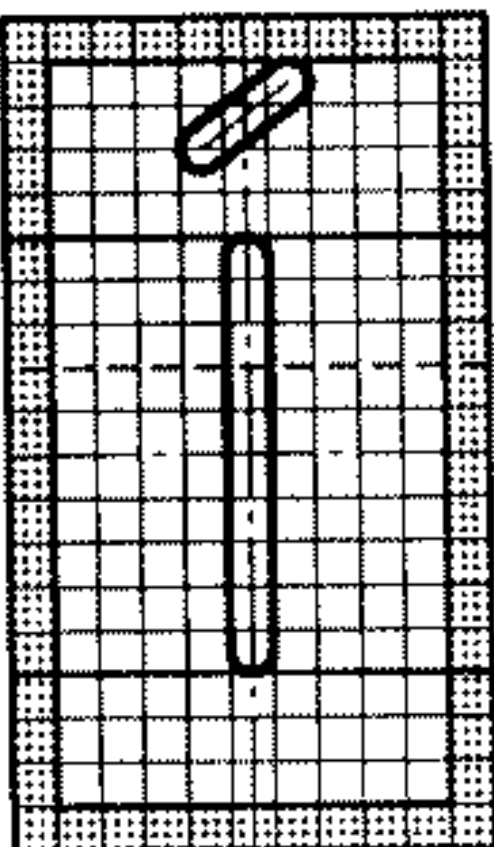
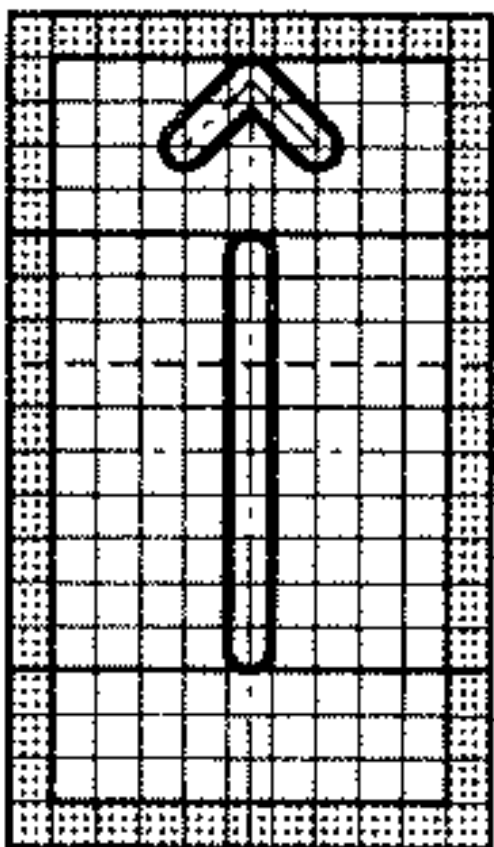
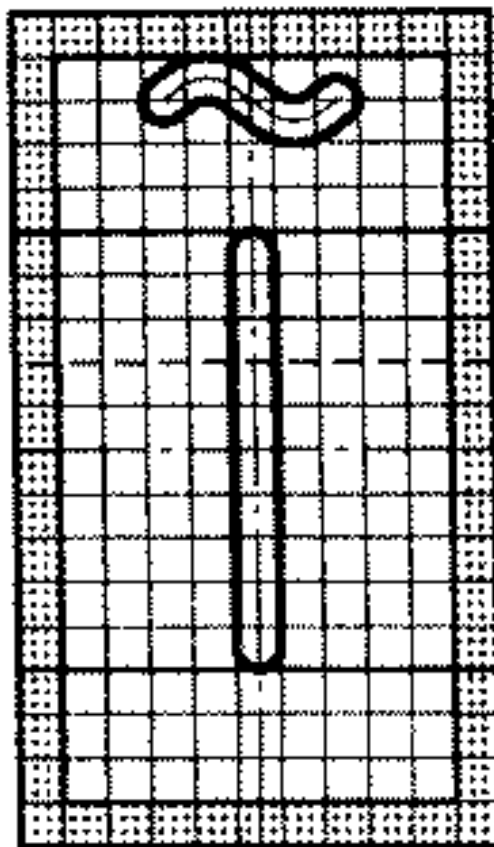
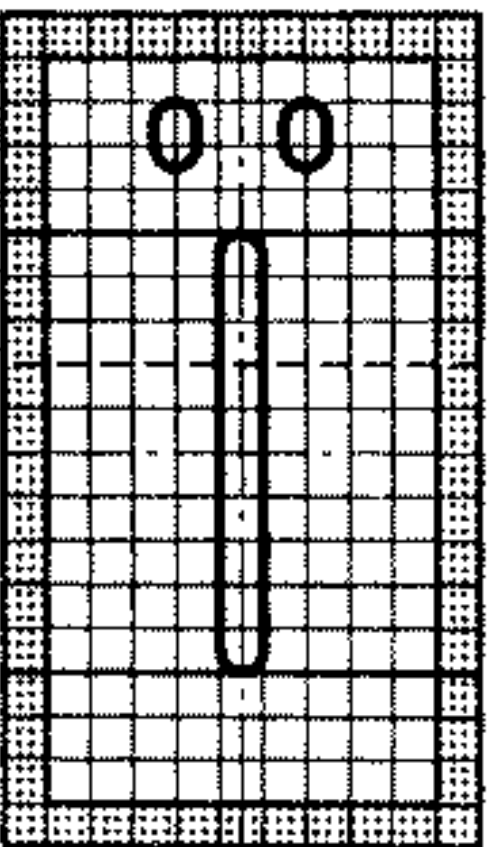
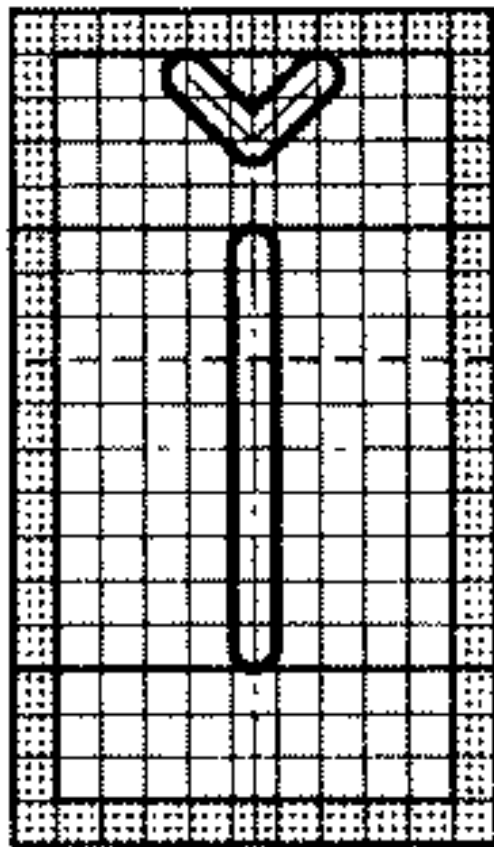
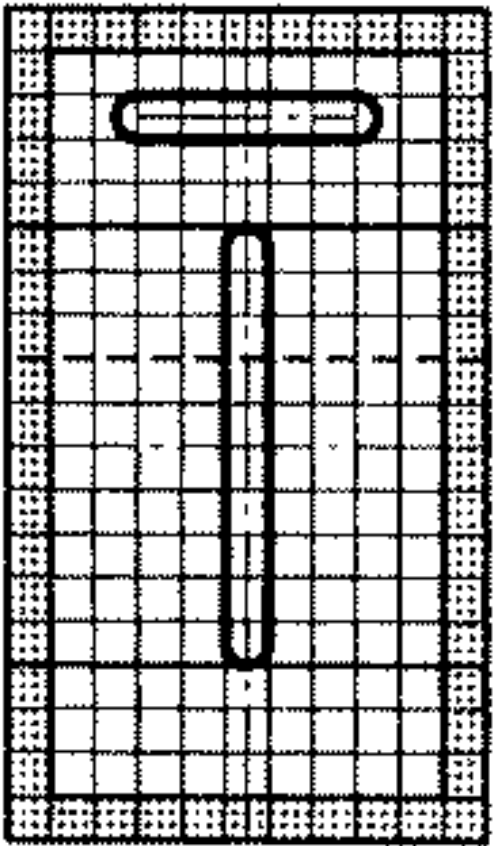
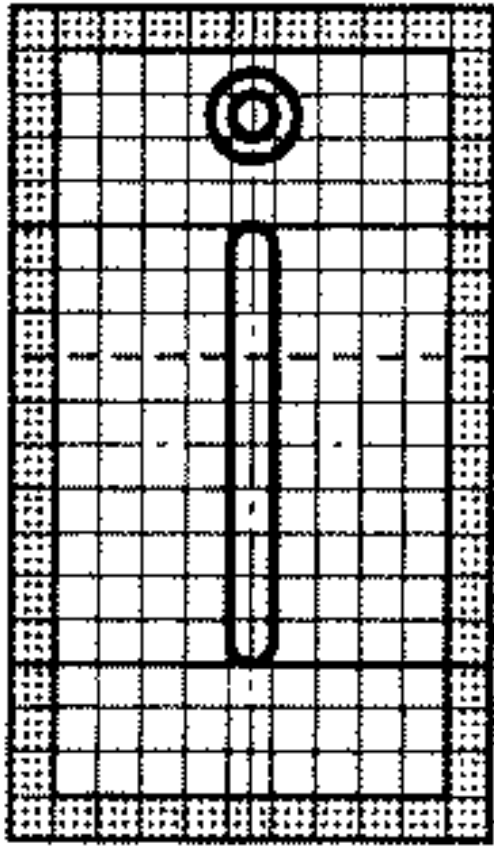
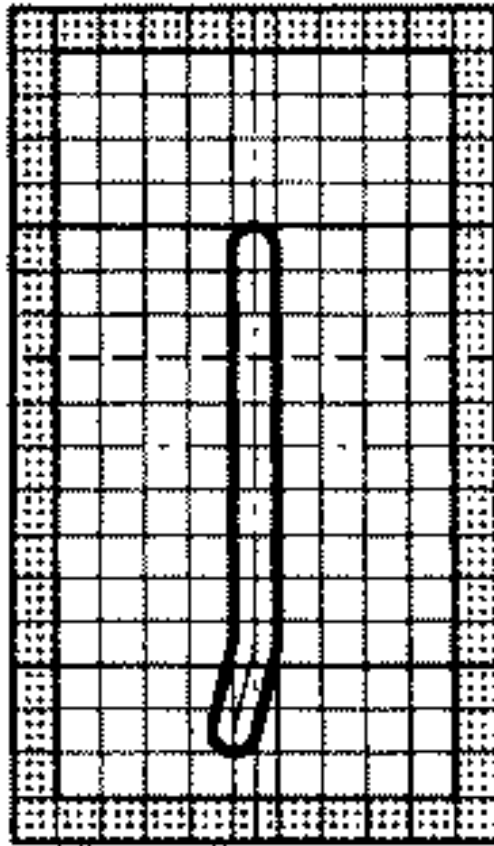
 009/00	 009/01	 009/02	 009/03	 009/04
	 009/05			 009/08
		 009/10	 009/11	 009/12

表 3 (续)

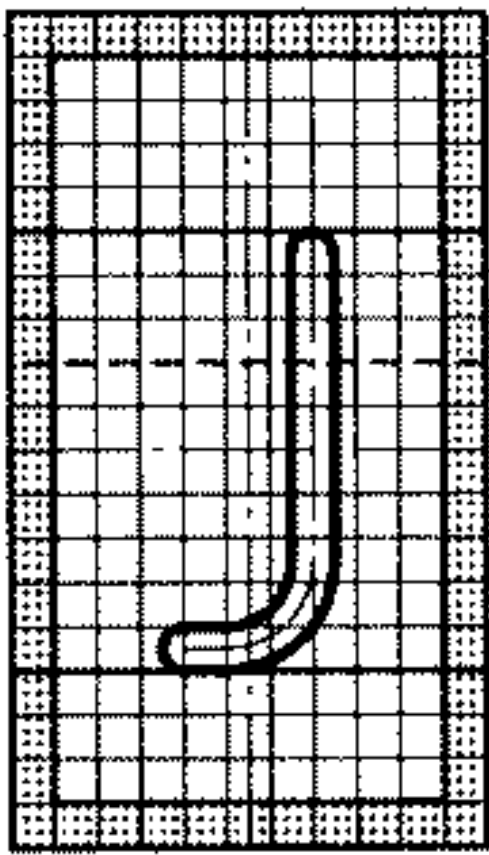
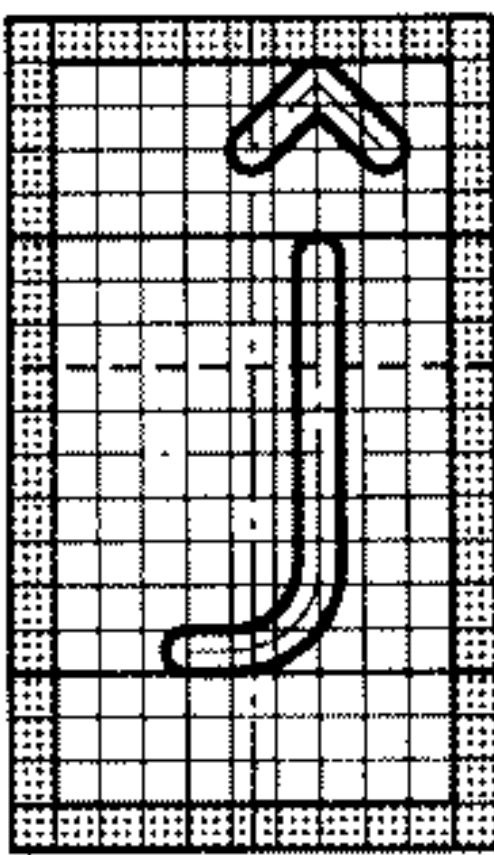
 010/00		 010/03		

表 3 (续)

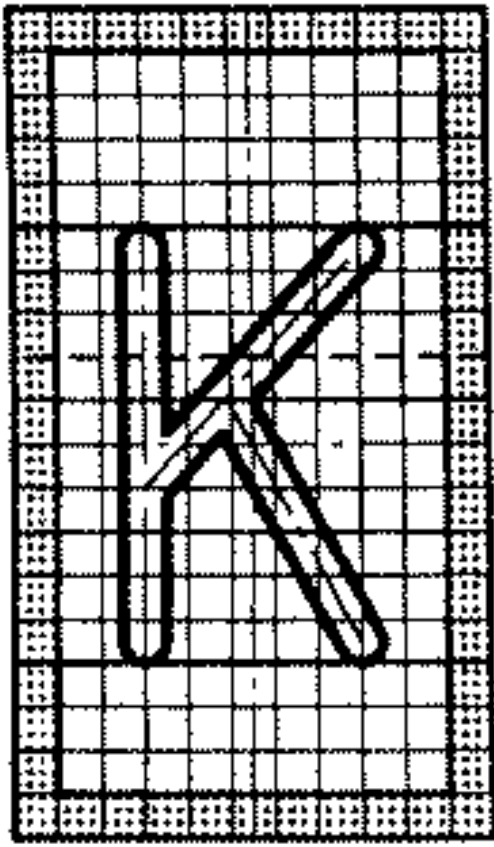
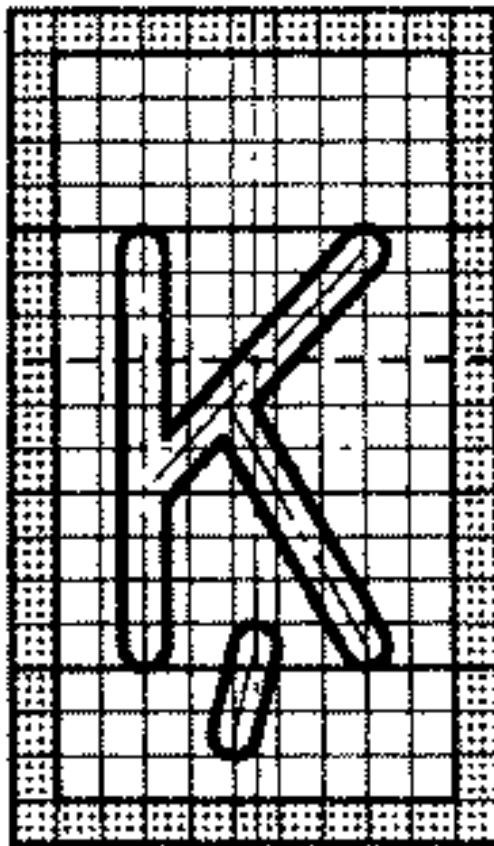
<div> 011/00</div>				
				<div> 011/12</div>

表 3 (续)

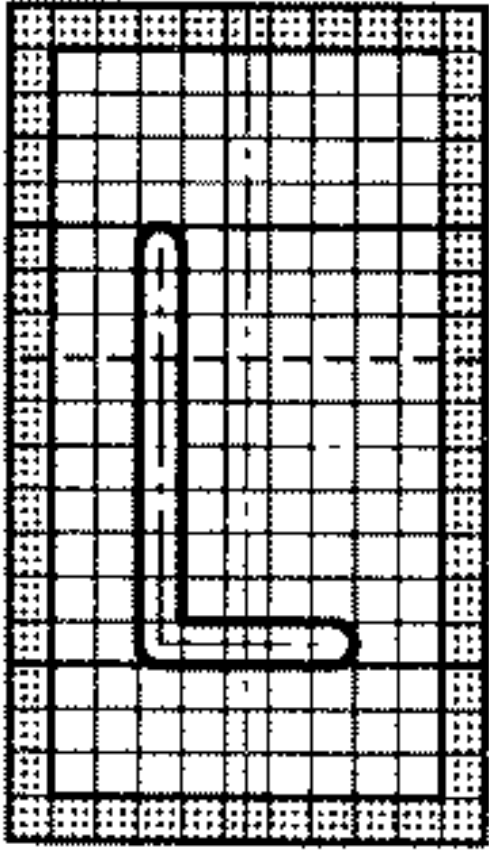
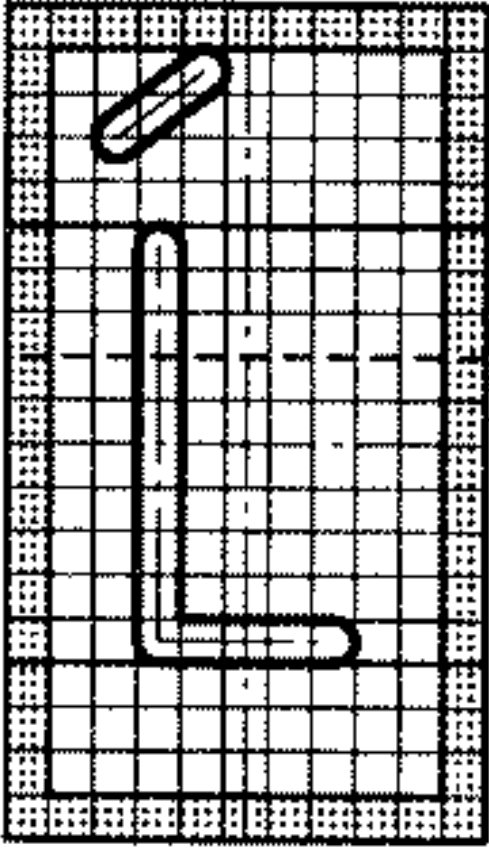
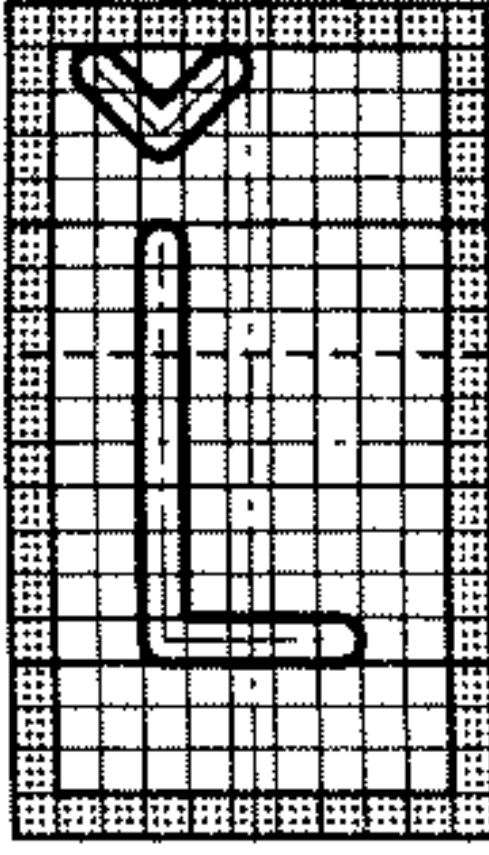
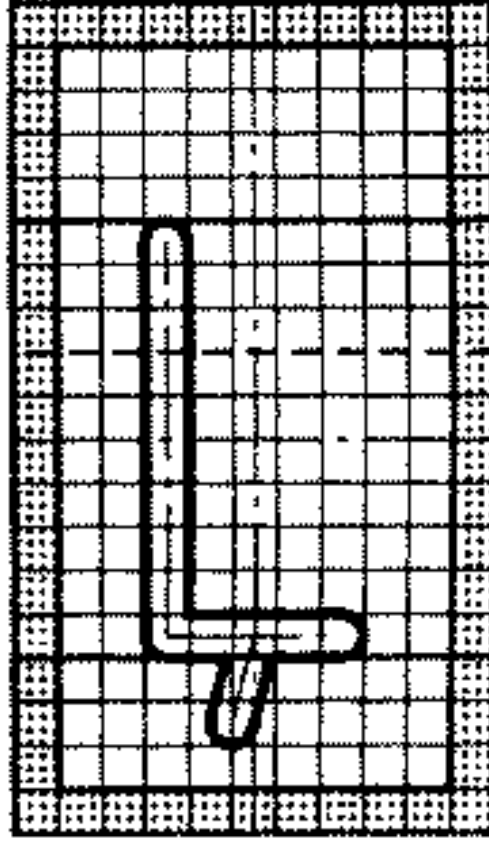
 <p>012/00</p>		 <p>012/02</p>		
				 <p>012/08</p>
				 <p>012/12</p>

表 3 (续)

<div></div> <div>013/00</div>				

表 3 (续)

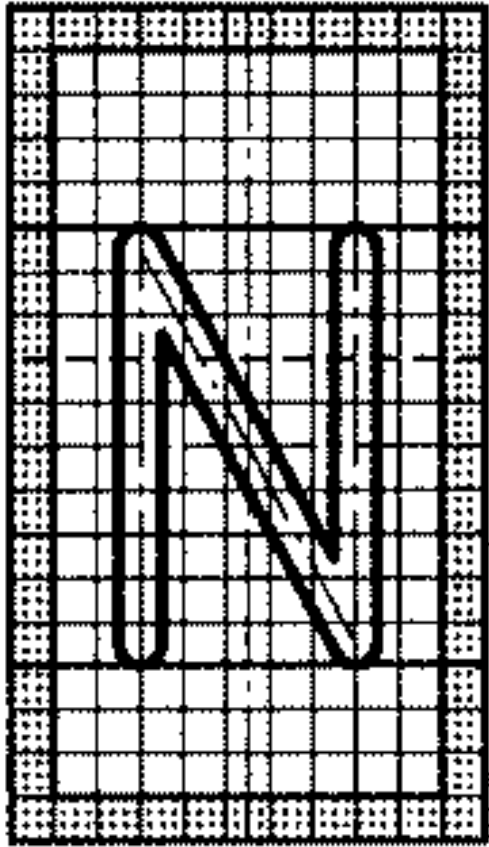
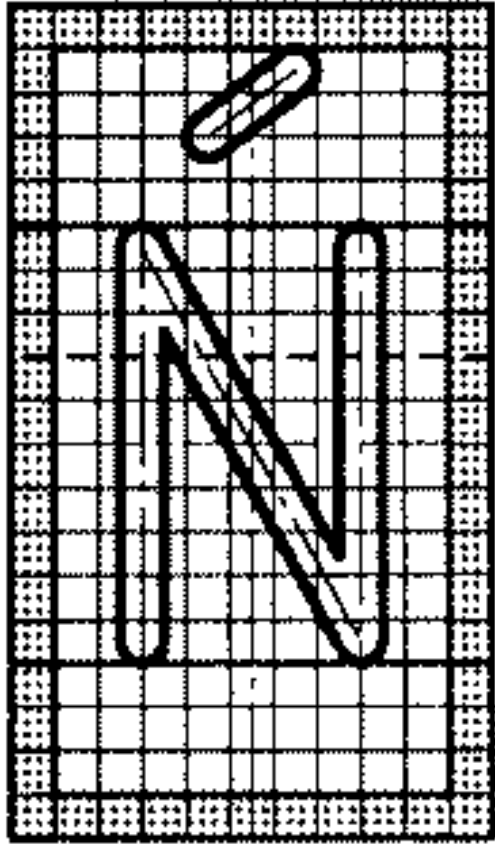
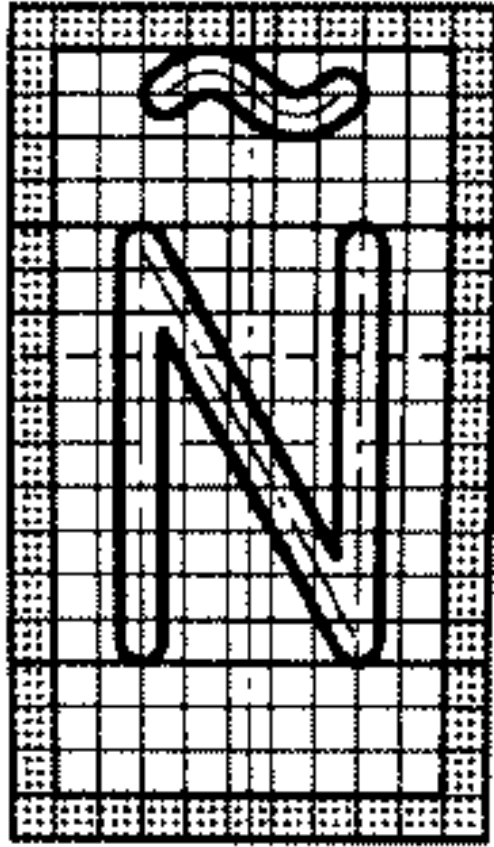
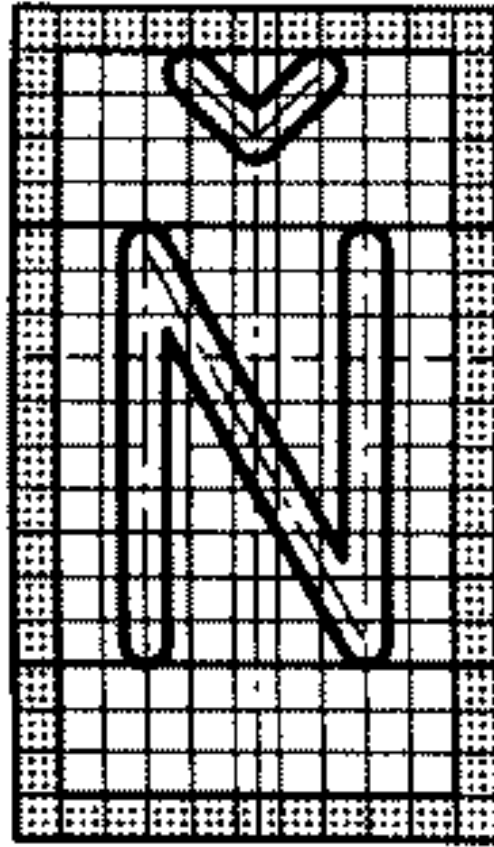
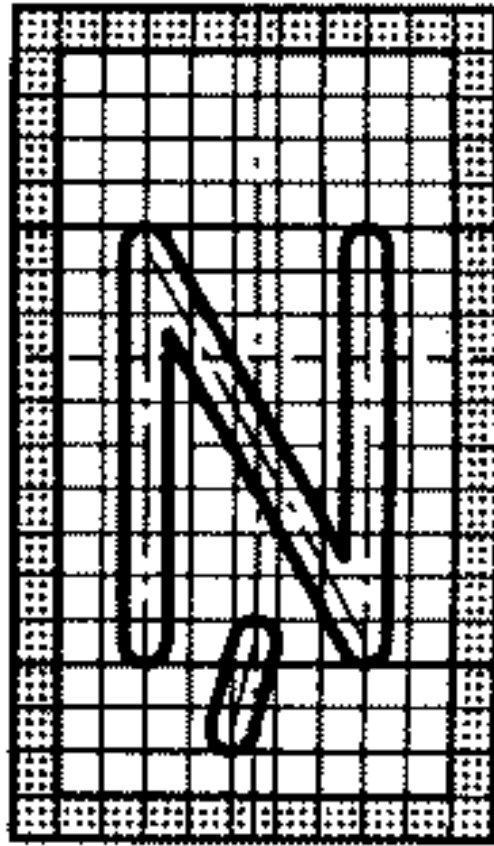
				
014/00		014/02		014/04
				
				014/08
				
				014/12

表 3 (续)

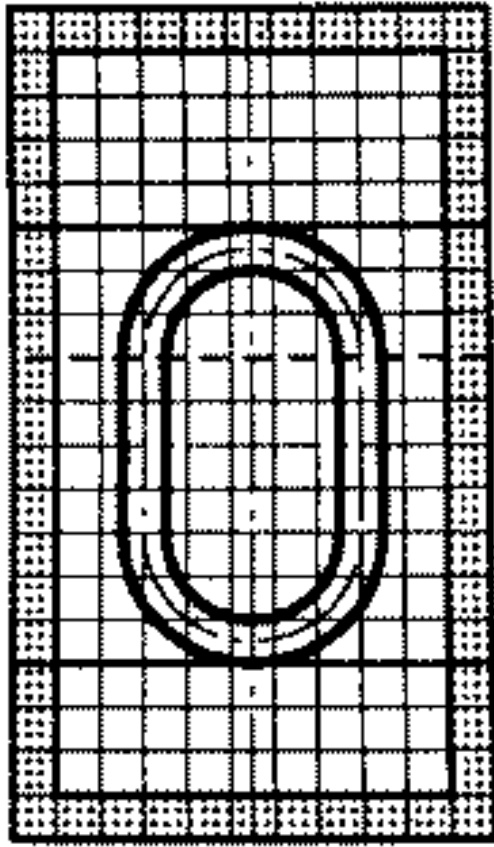
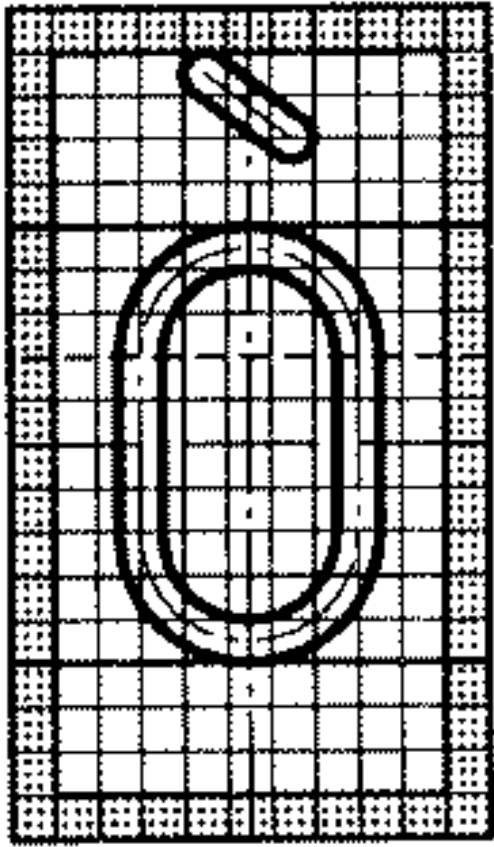
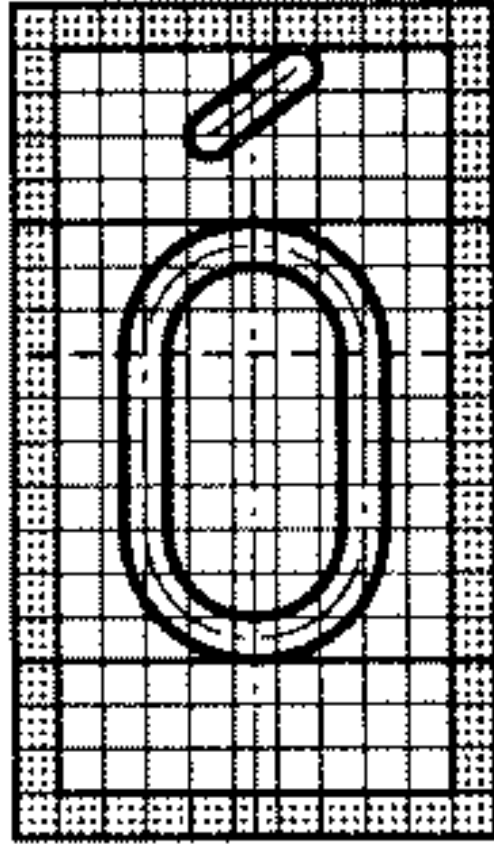
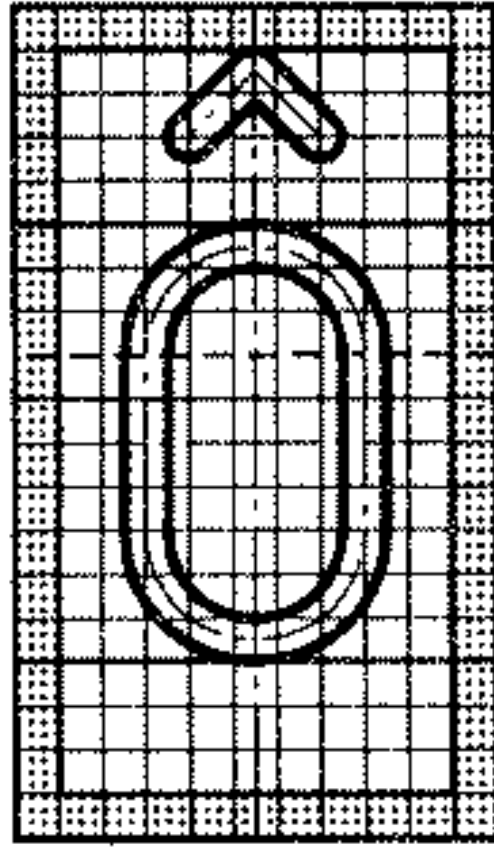
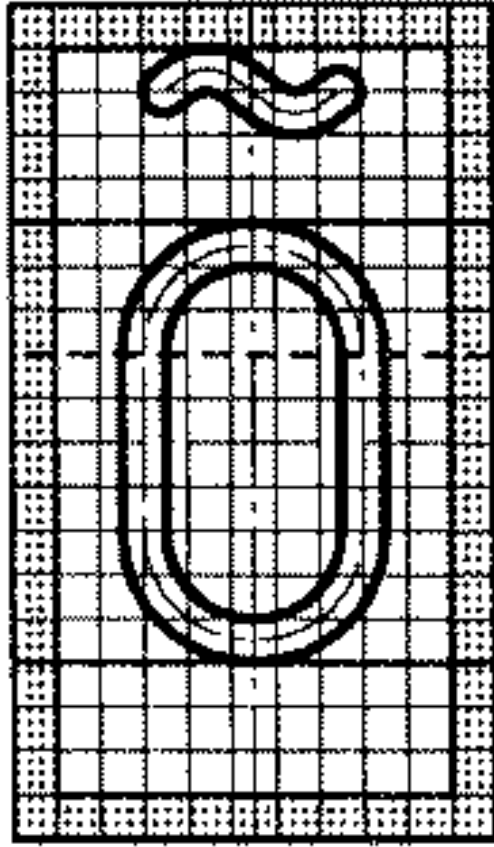
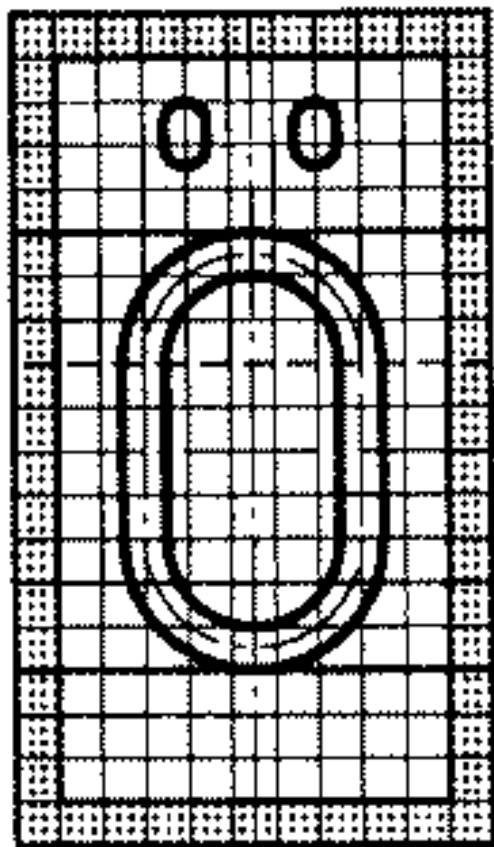
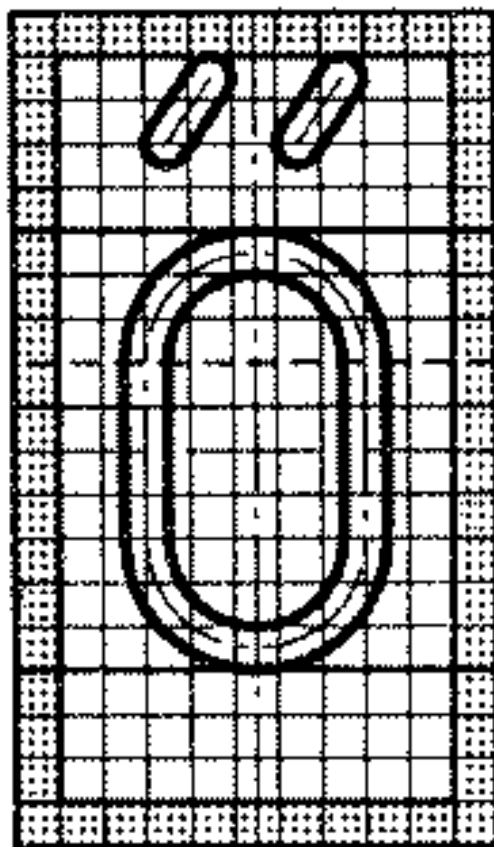
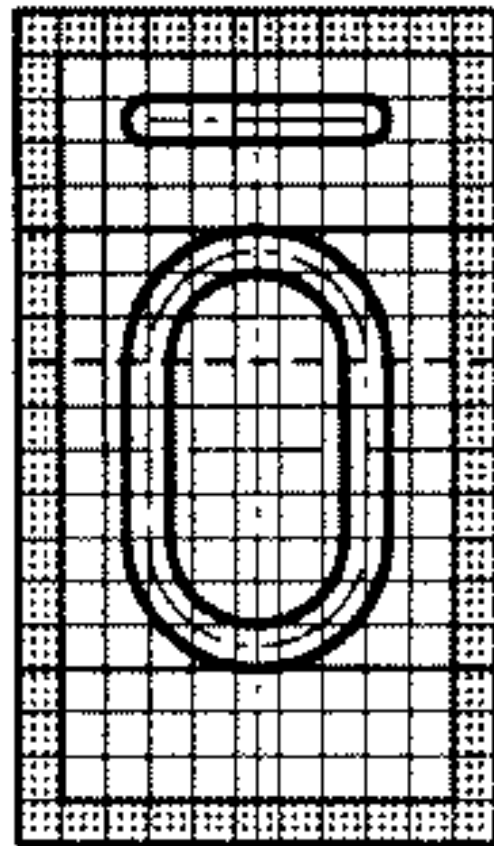
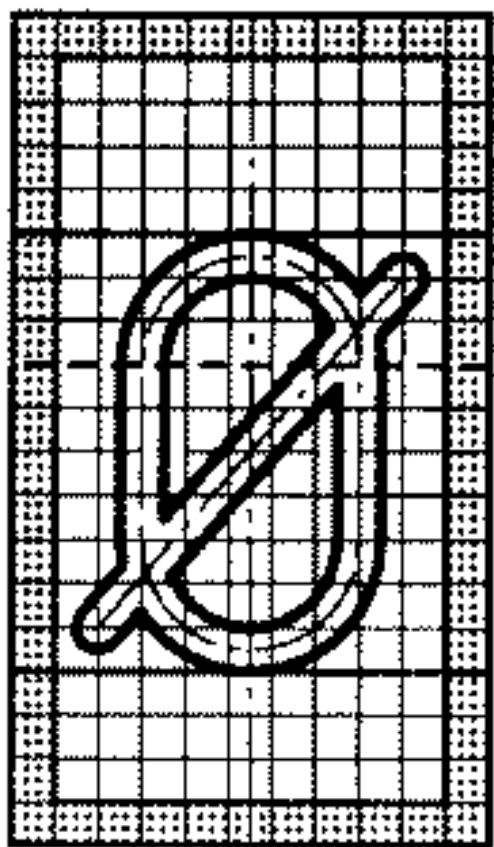
 015/00	 015/01	 015/02	 015/03	 015/04
	 015/05		 015/07	
		 015/10		
	 015/13			

表 3 (续)

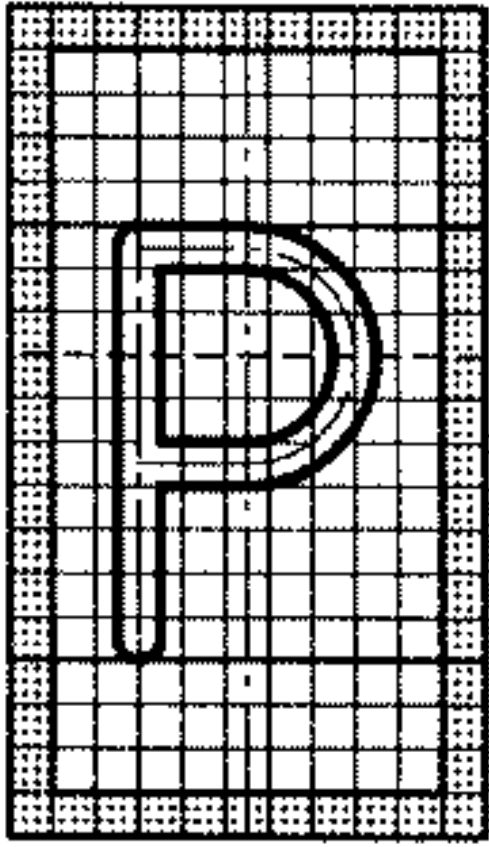
<div></div> <div>016/00</div>				

表 3 (续)

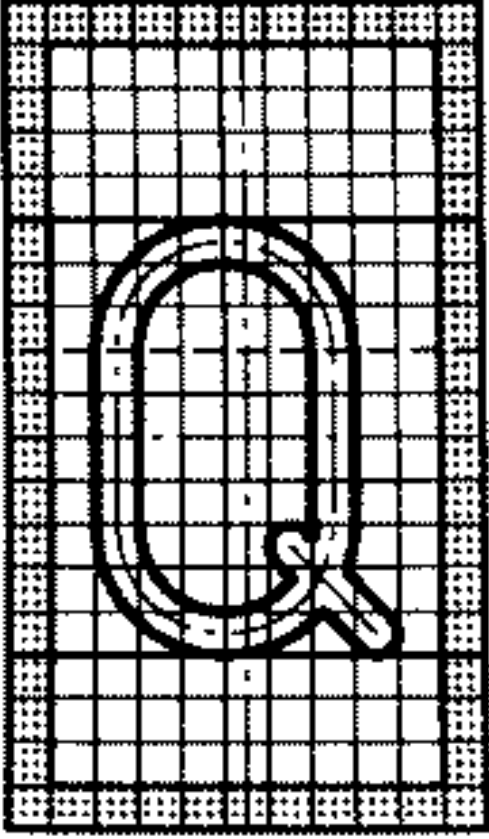
<div><p>017/00</p></div>				

表 3 (续)

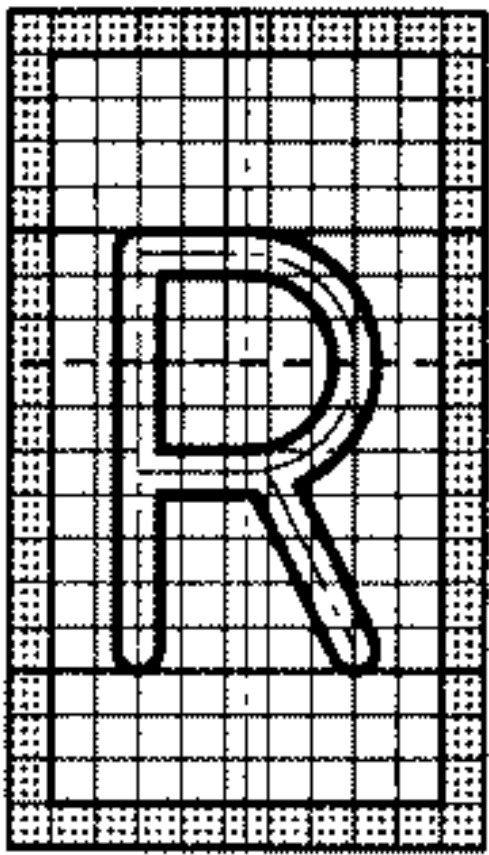
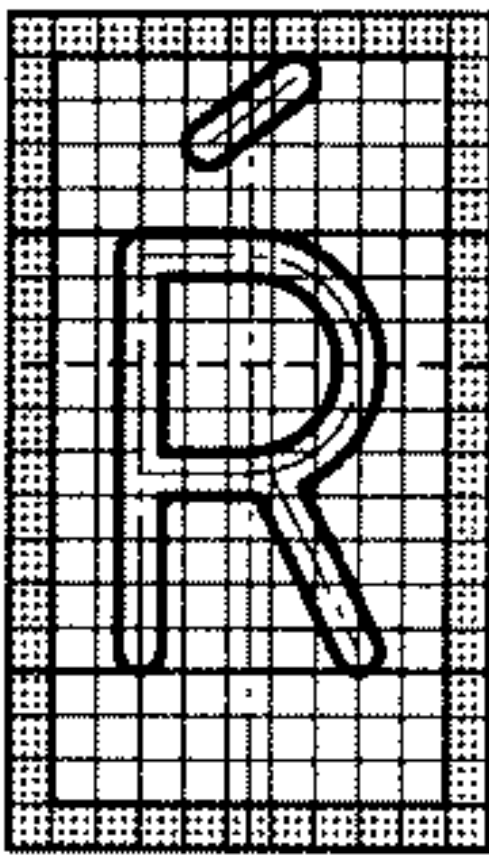
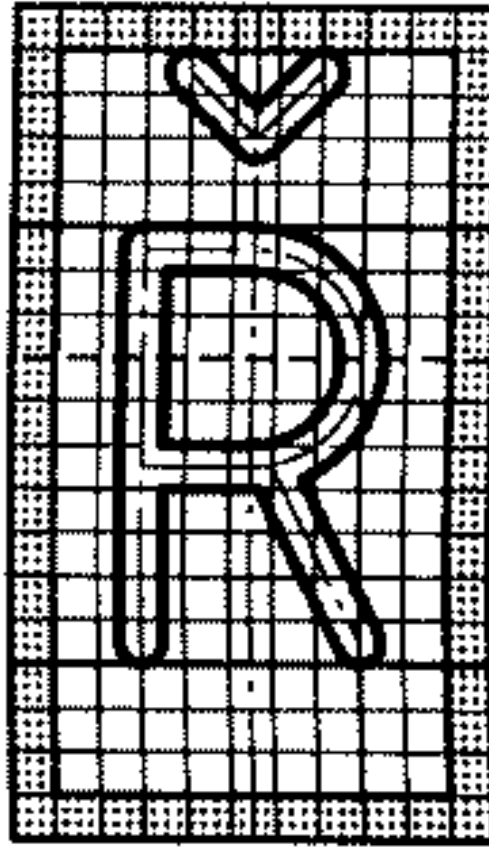
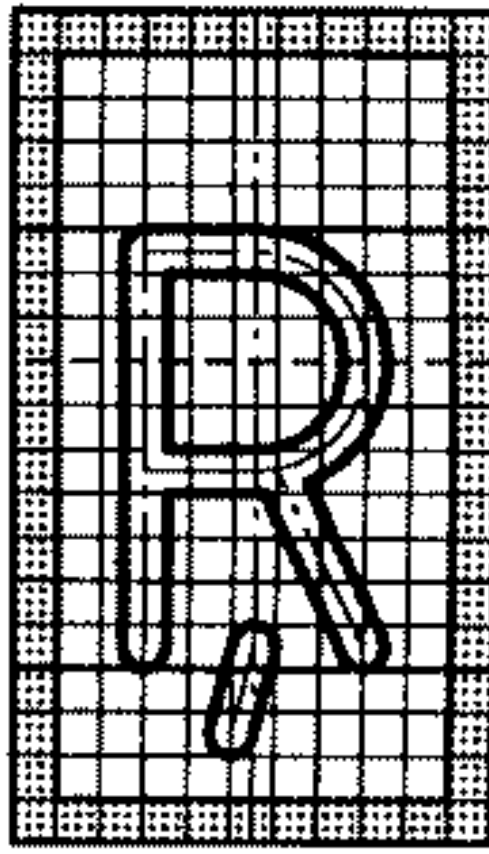
 018/00		 018/02		
				 018/08
				 018/12

表 3 (续)

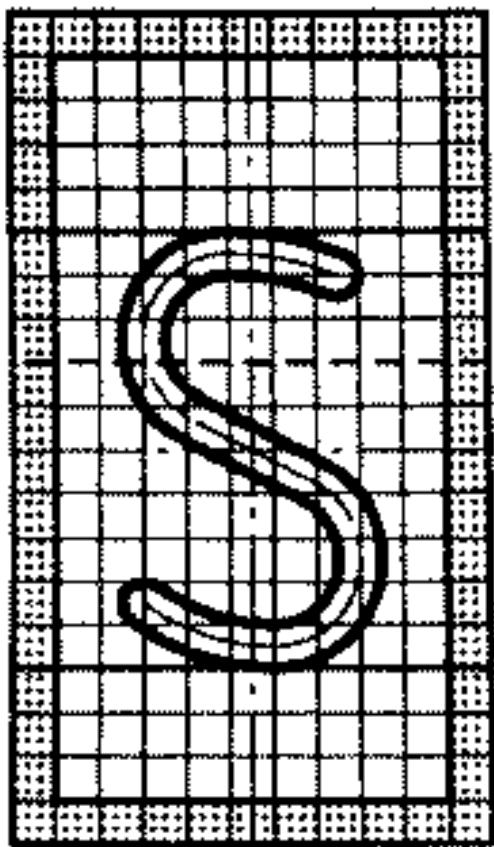
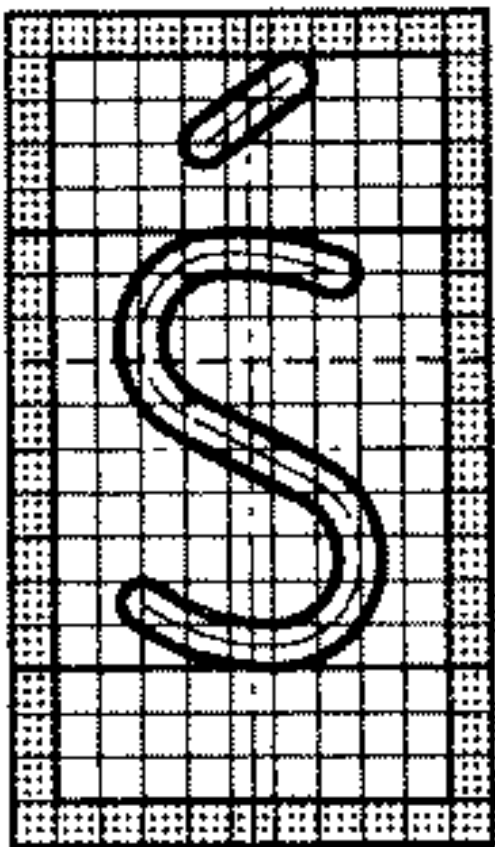
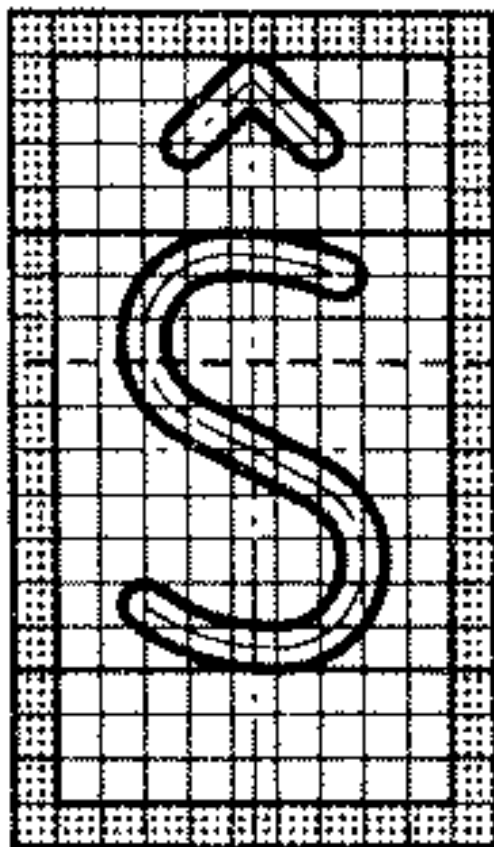
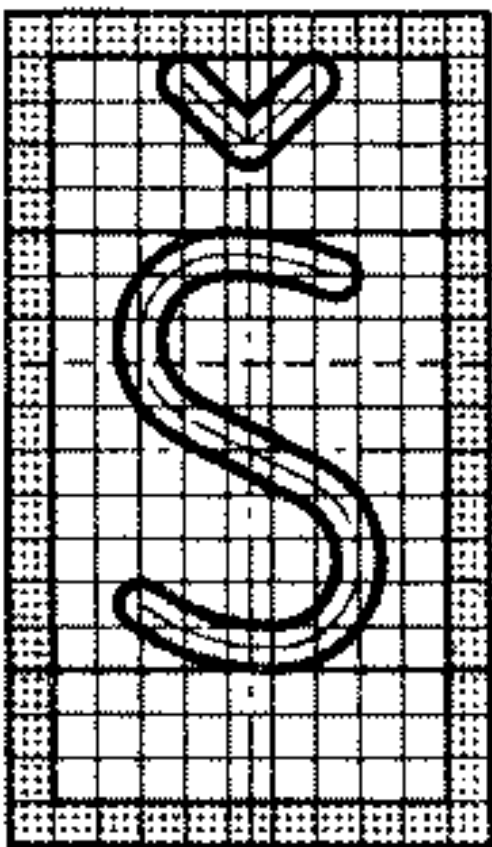
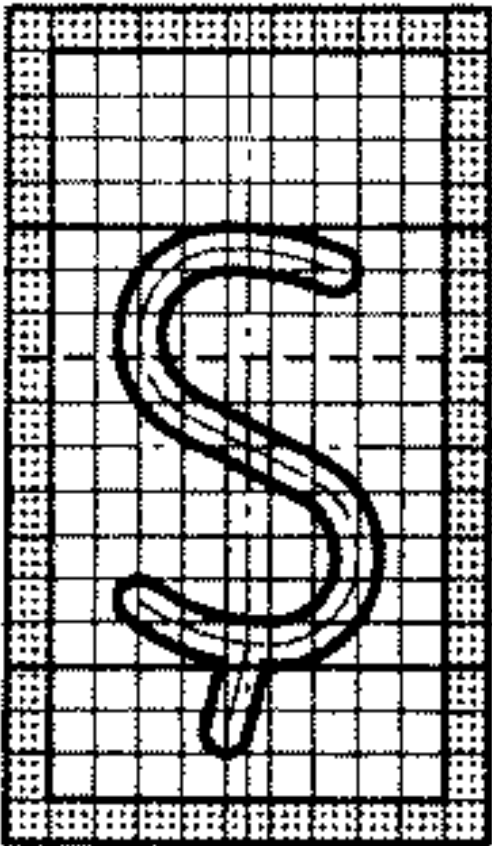
 019/00		 019/02	 019/03	
				 019/08
				 019/12

表 3 (续)

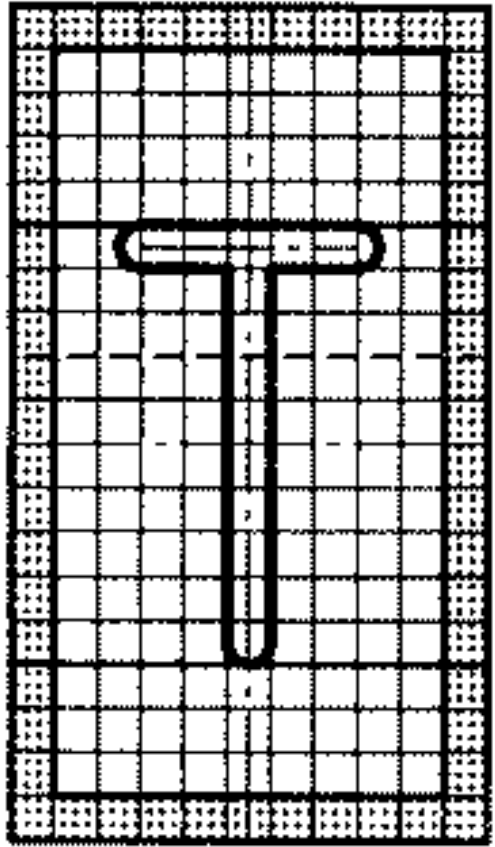
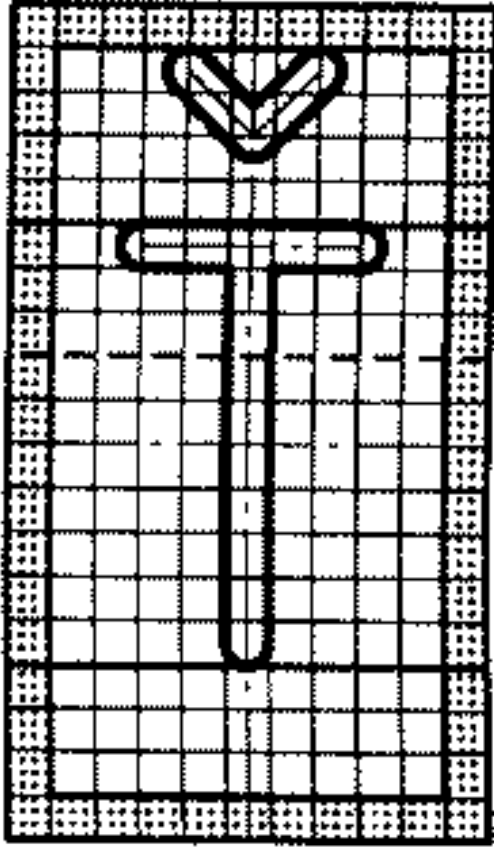
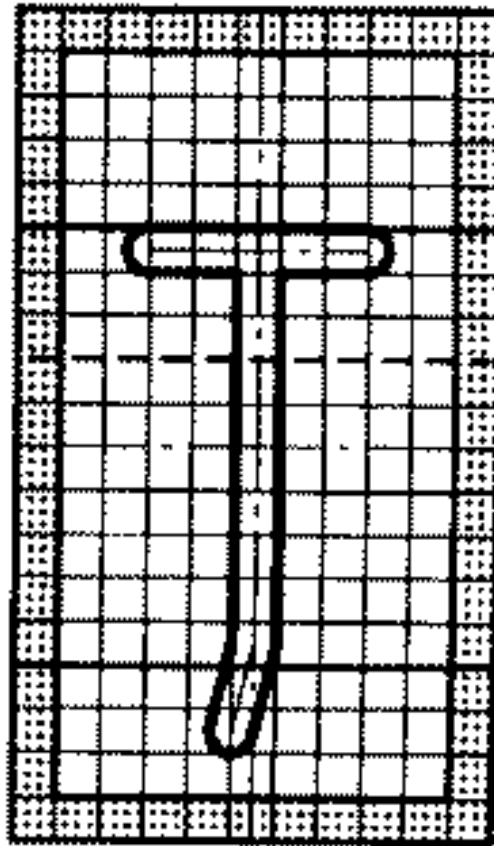
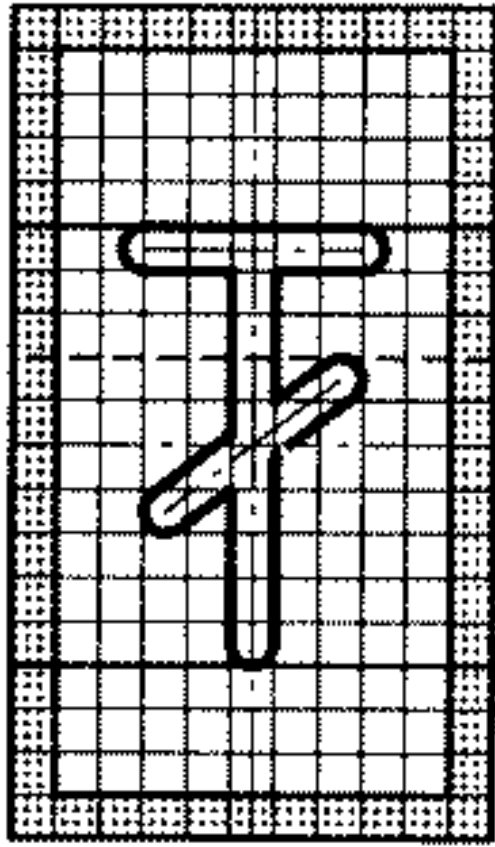
 020/00				
				 020/08
				 020/12
		 020/14		

表 3 (续)

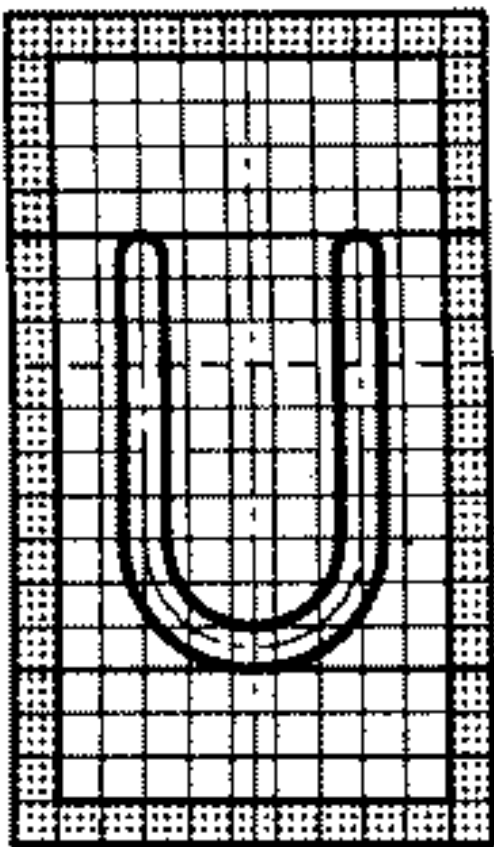
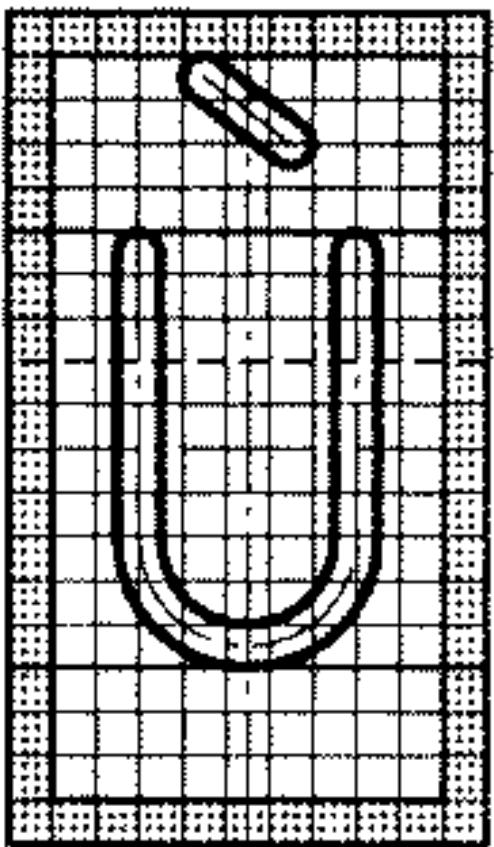
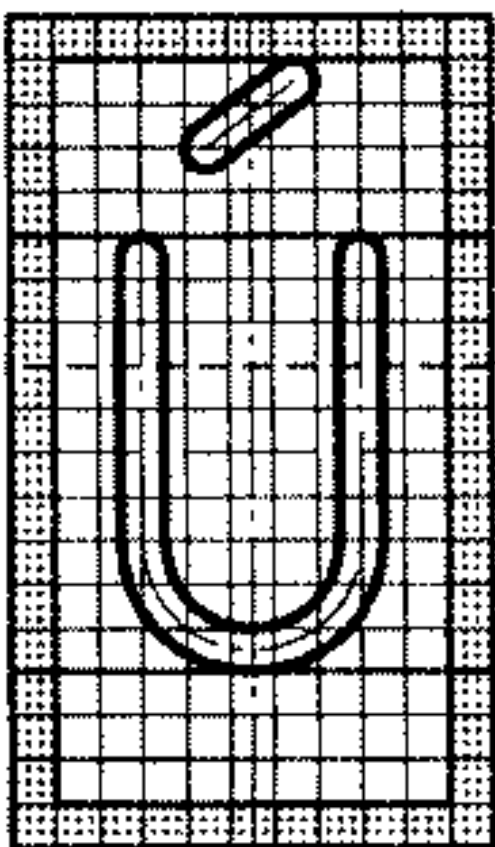
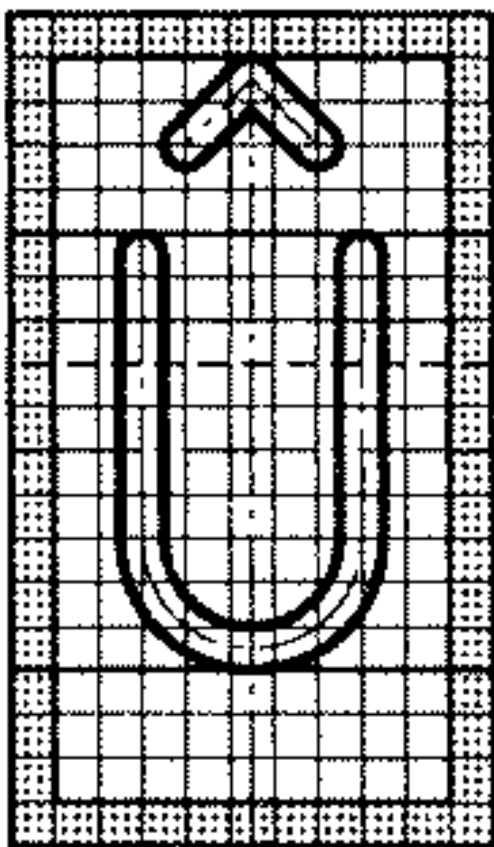
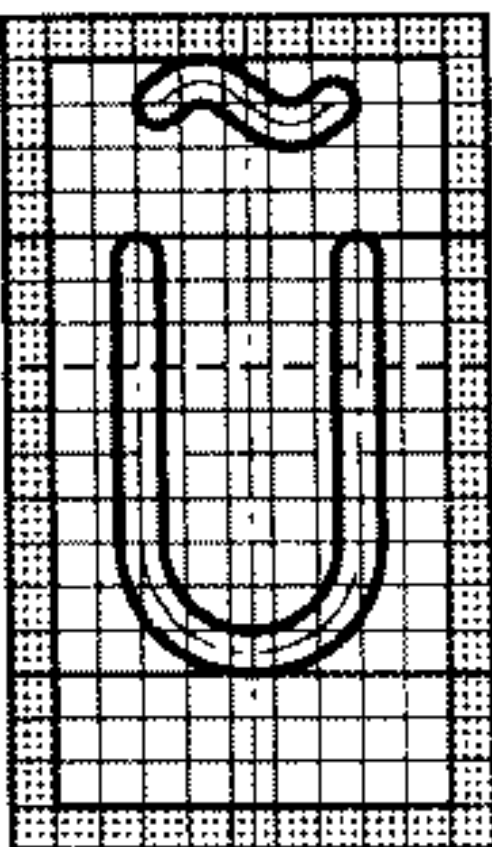
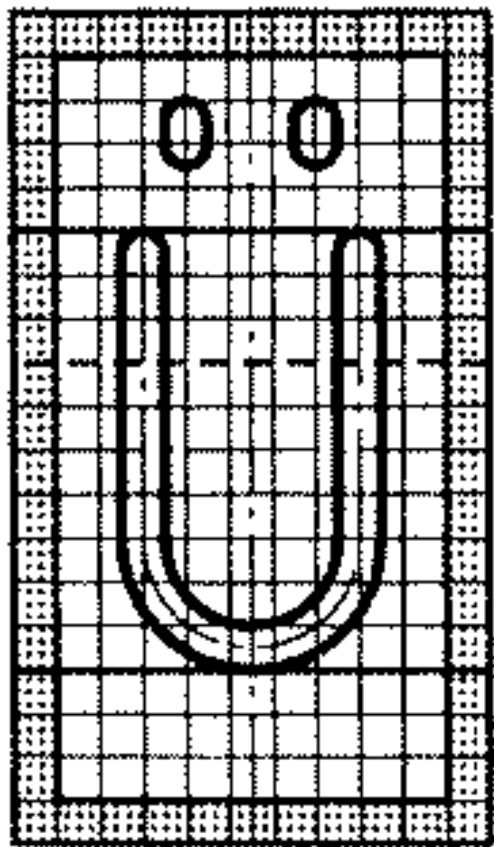
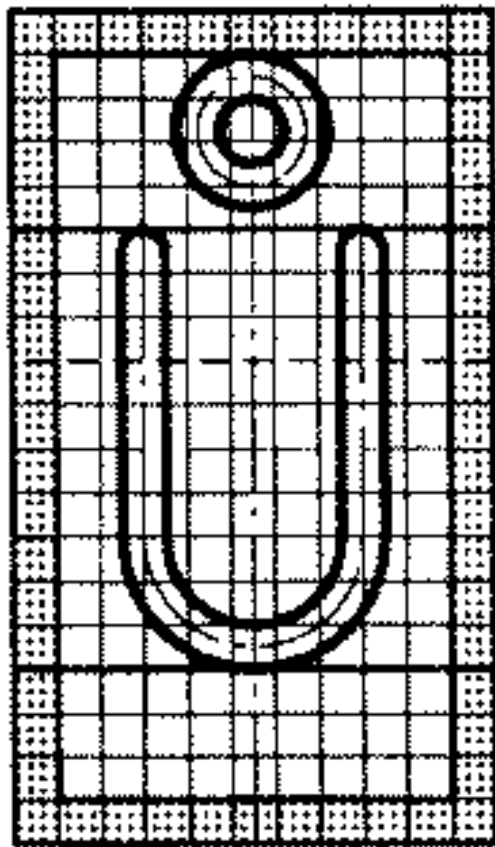
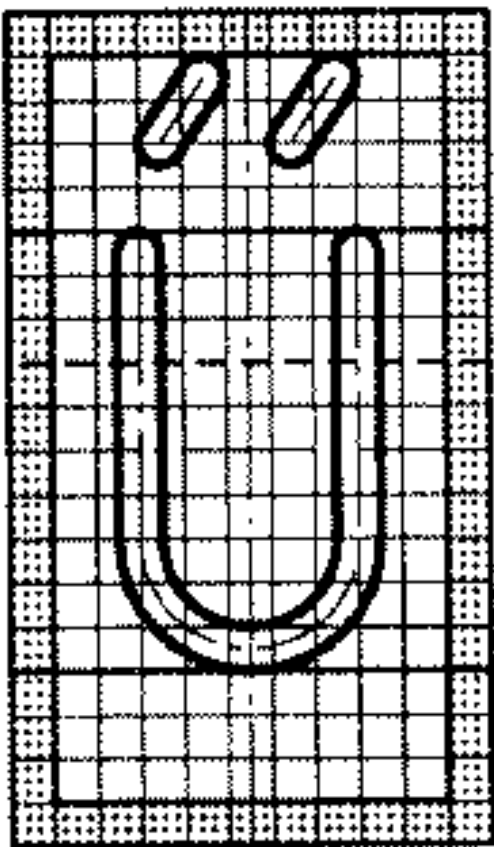
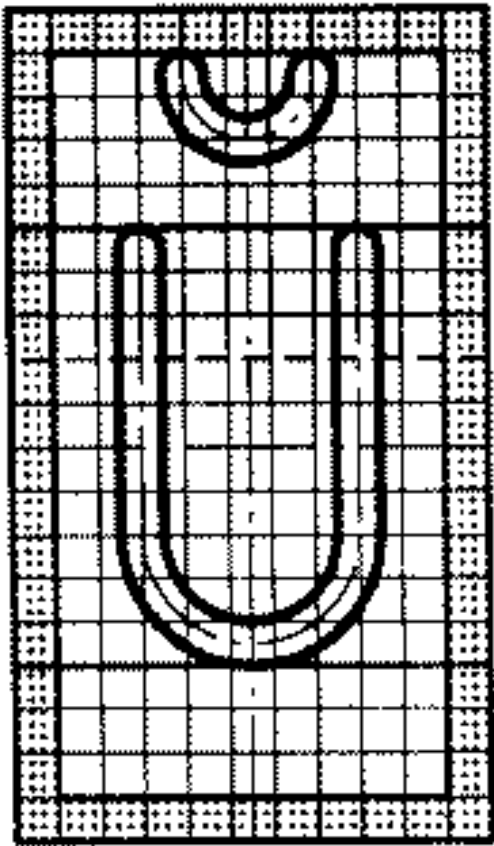
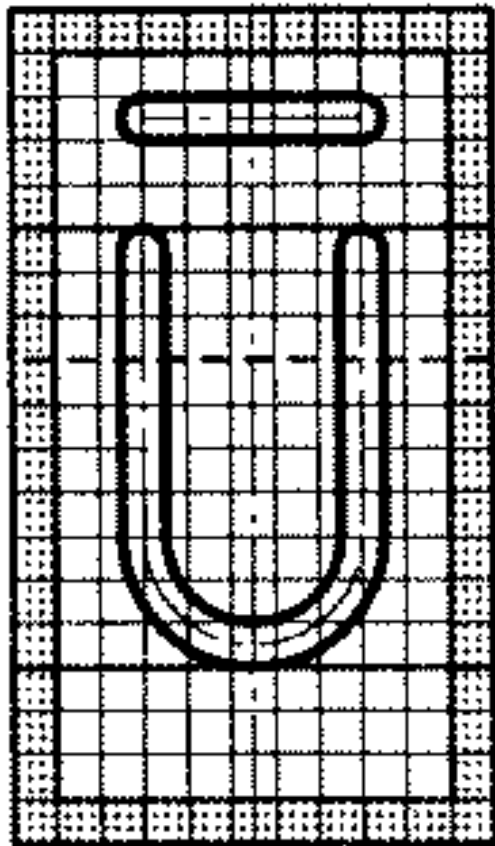
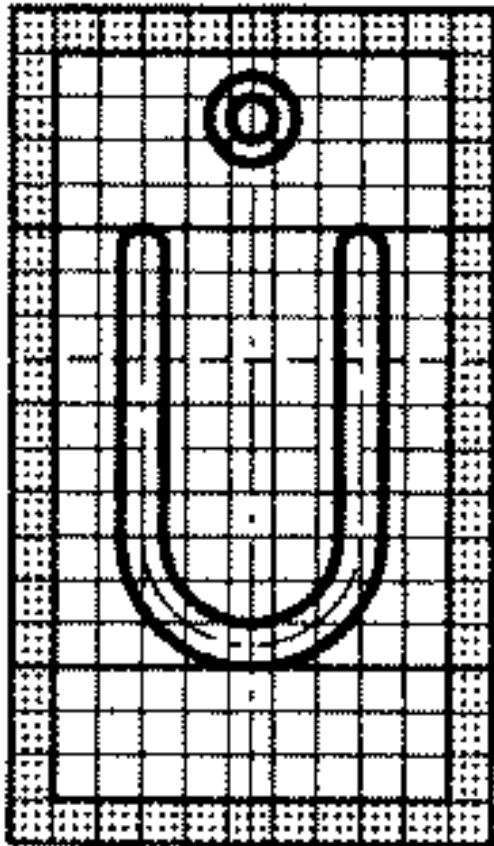
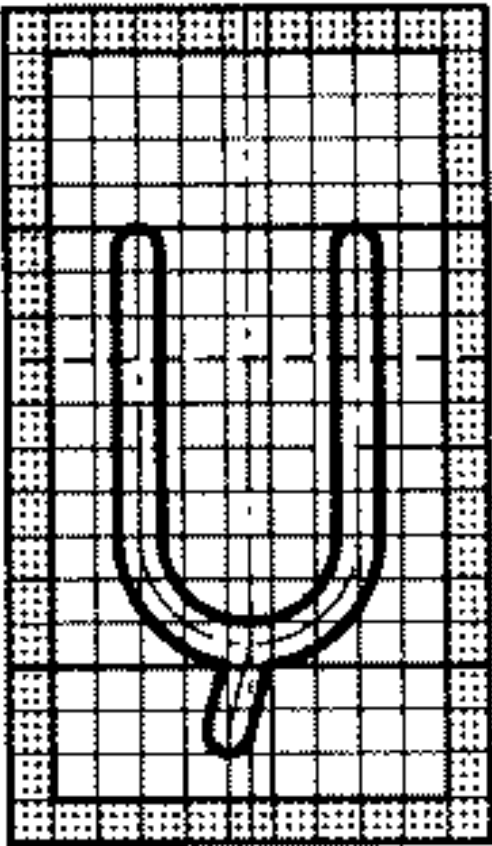
 021/00	 021/01	 021/02	 021/03	 021/04
	 021/05	 021/06	 021/07	
	 021/09	 021/10	 021/11	 021/12

表 3 (续)

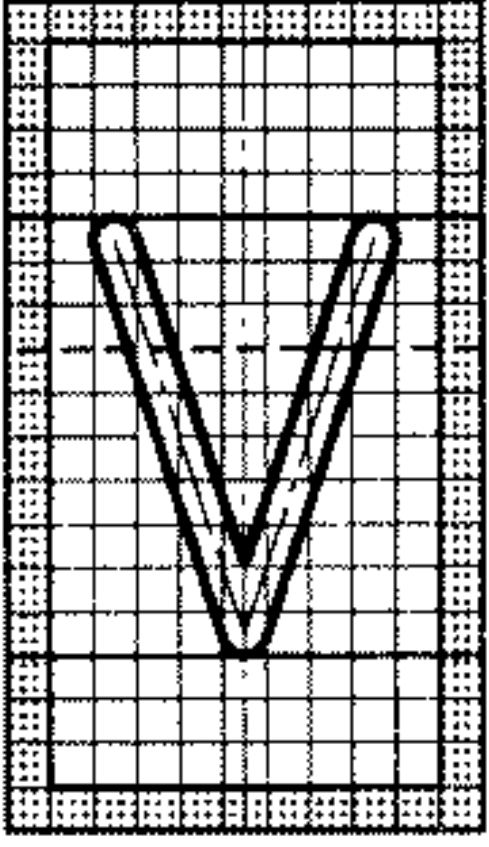
<div><p>022/00</p></div>				

表 3 (续)

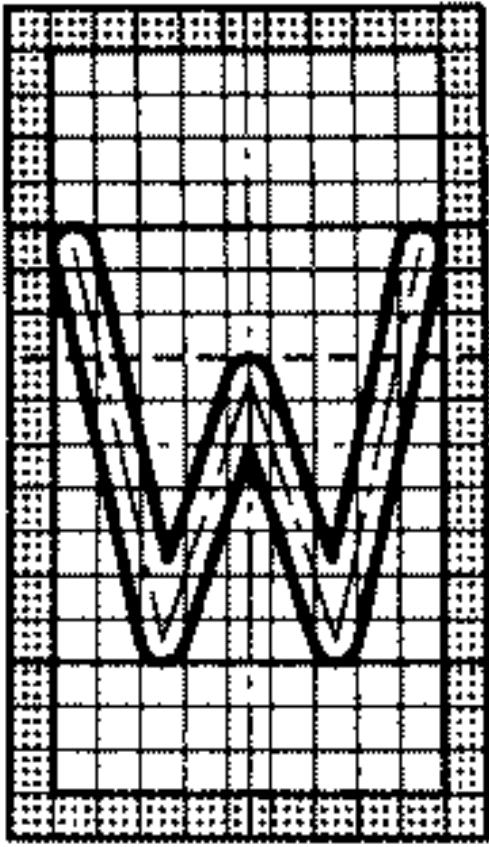
<div> 023/00</div>				

表 3 (续)

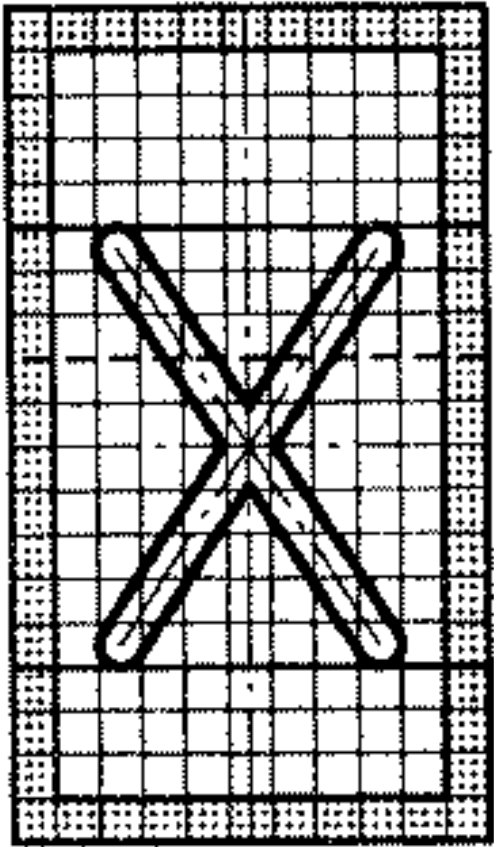
<div><p>024/00</p></div>				

表 3 (续)

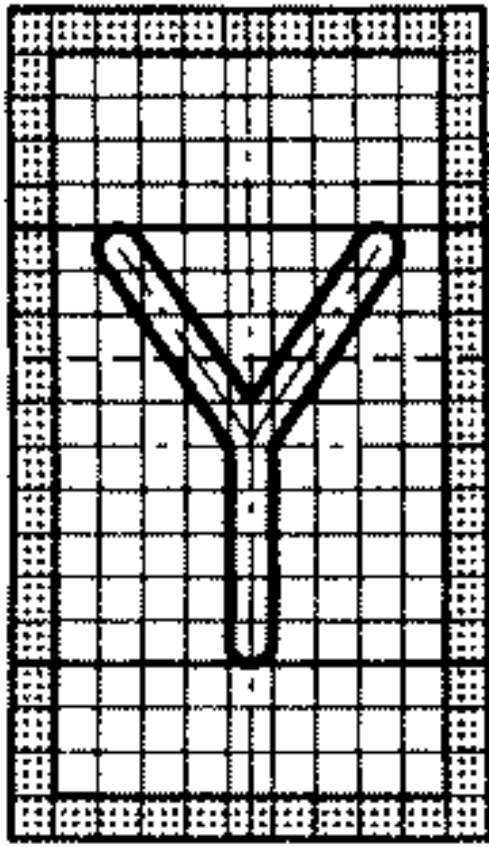
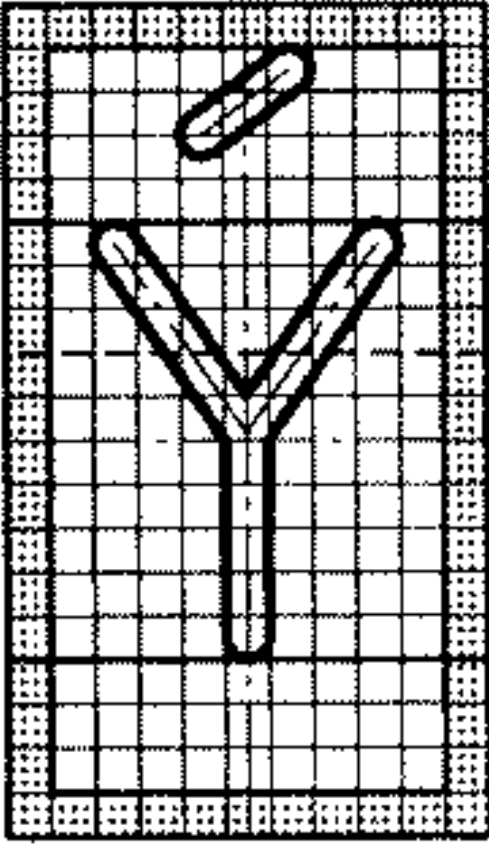
 025/00		 025/02		

表 3 (完)

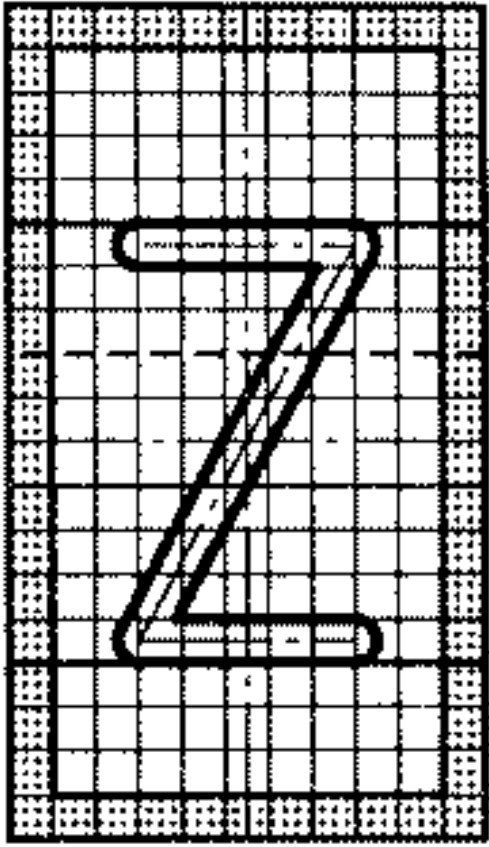
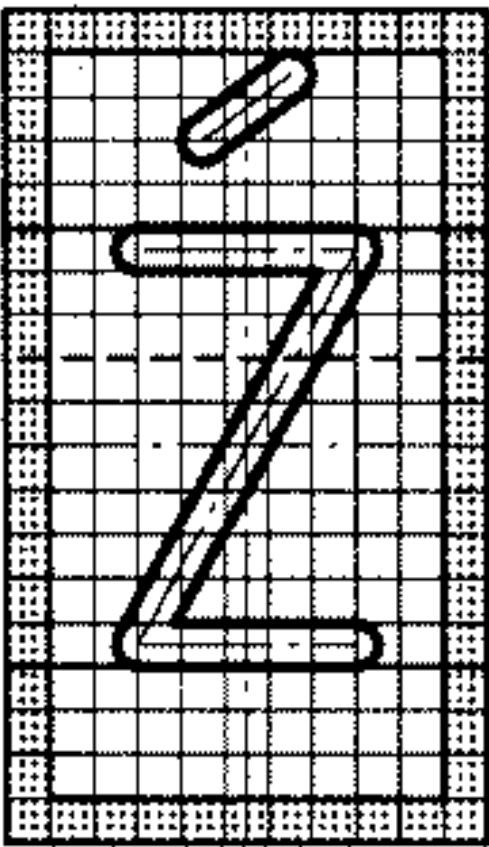
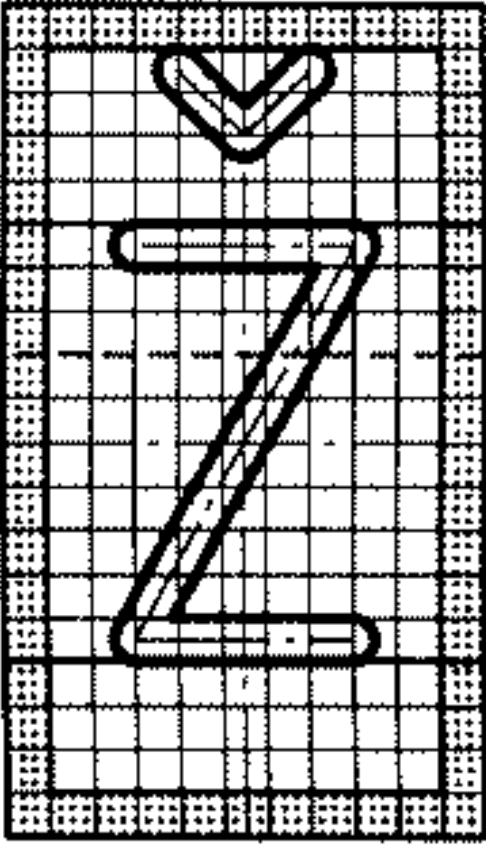
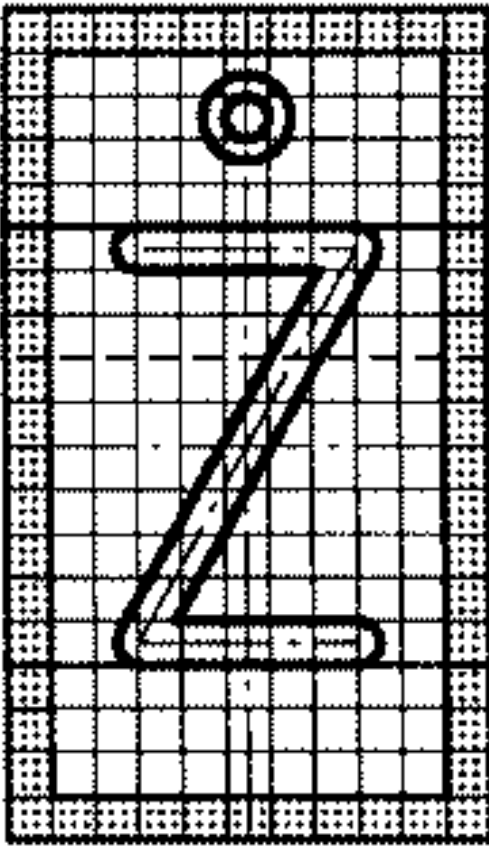
 026/00		 026/02		
				 026/08
			 026/11	

表 4 小写字母及发音符号

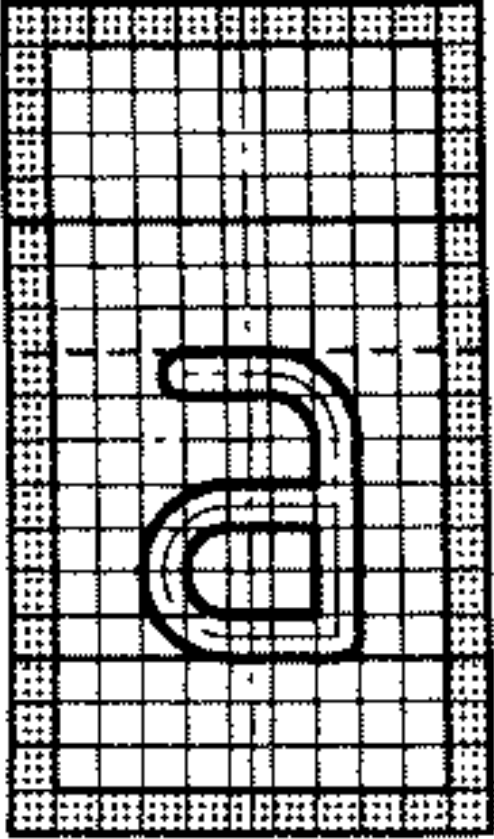
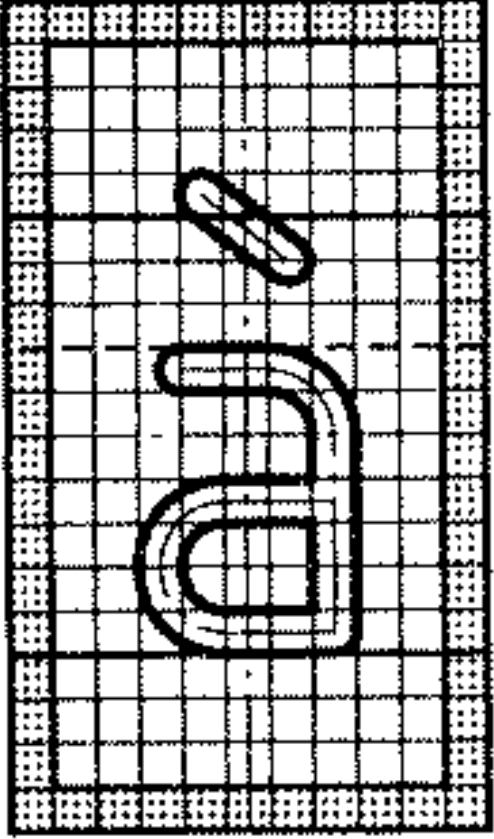
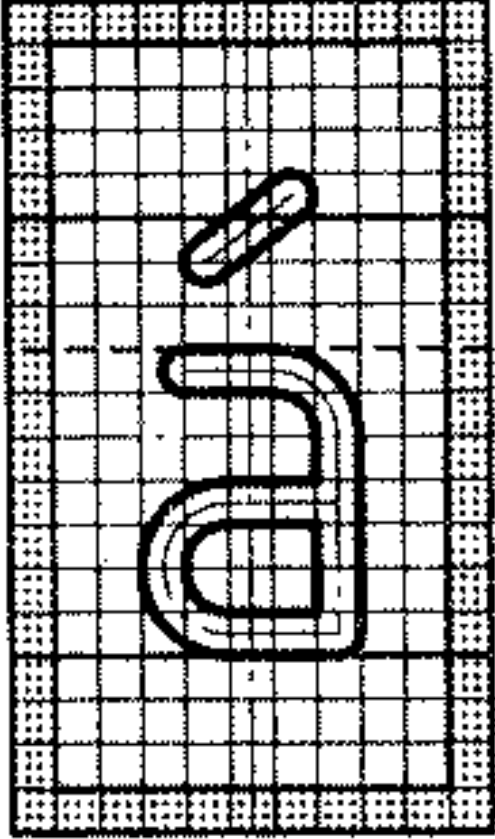
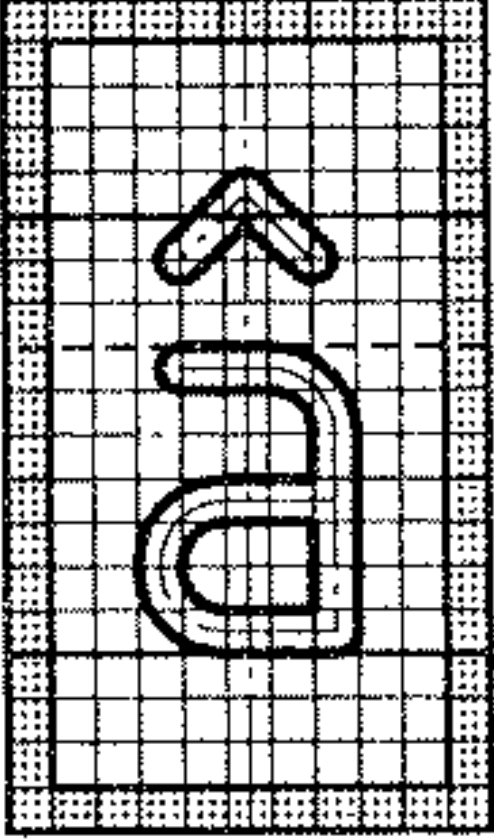
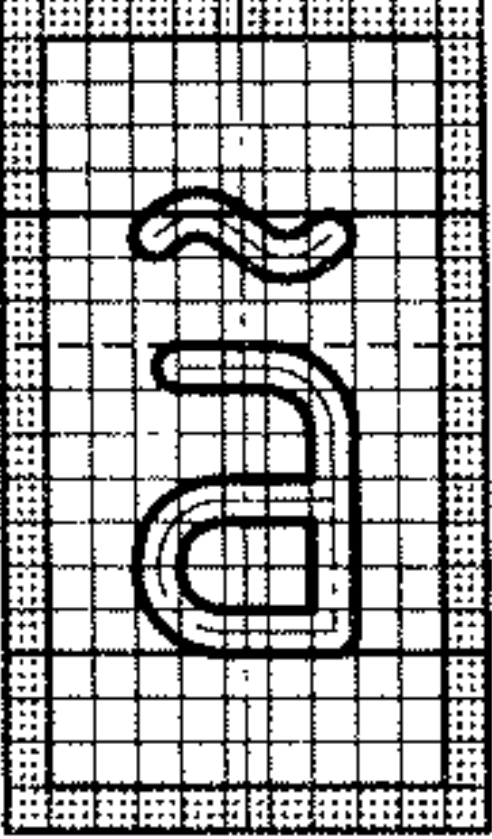
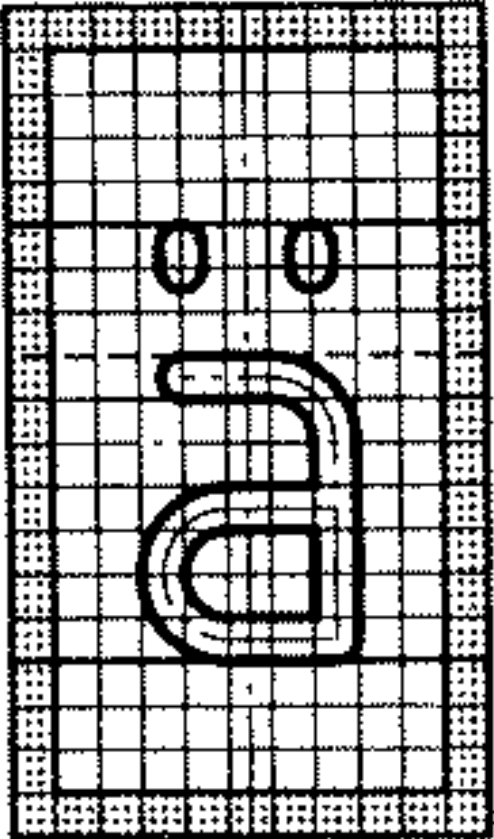
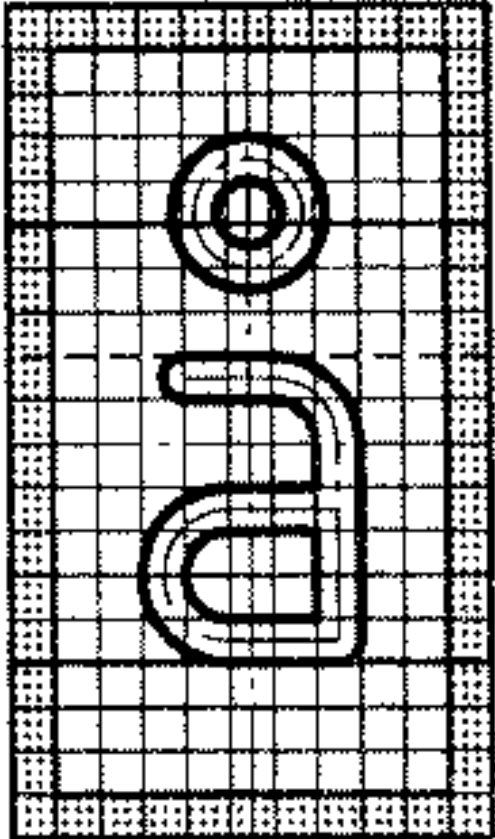
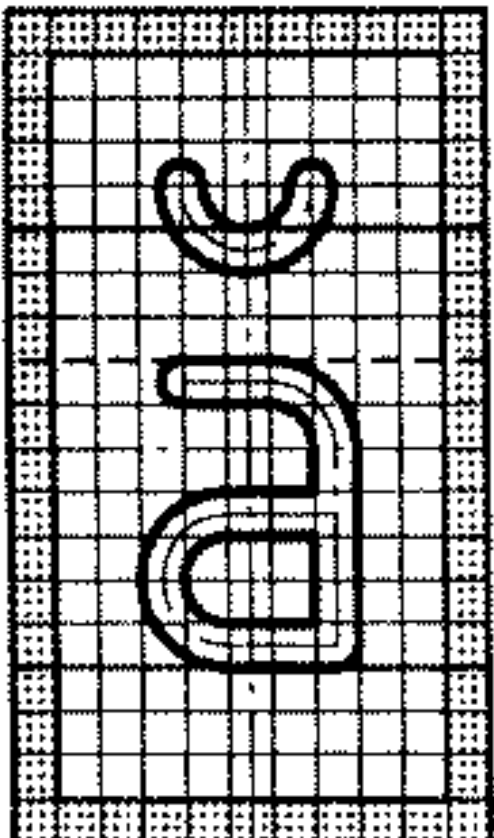
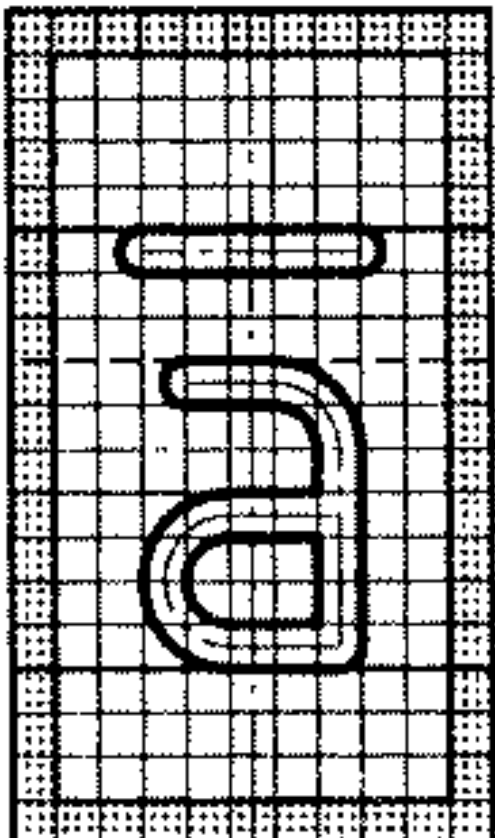
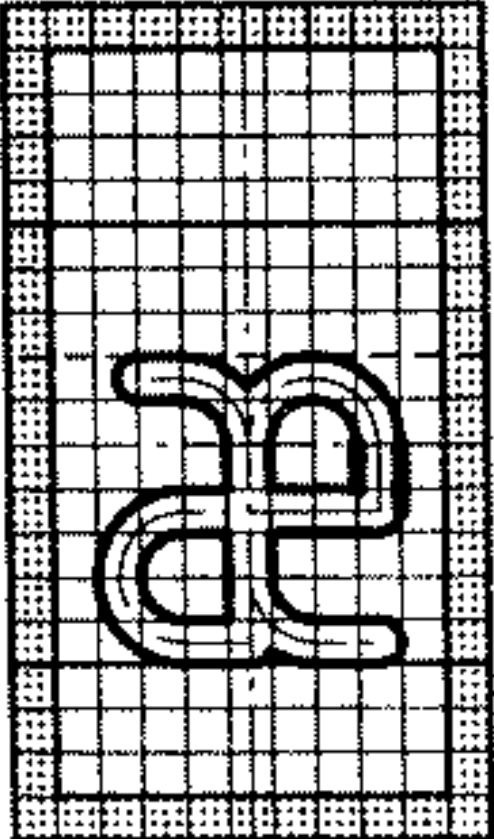
 101/00	 101/01	 101/02	 101/03	 101/04
	 101/05	 101/06		
	 101/09	 101/10		
	 101/17			

表 4 (续)

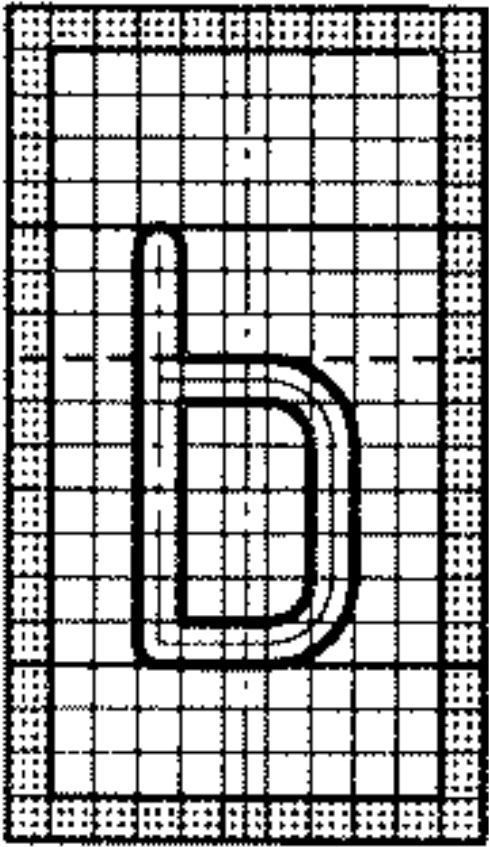
<div></div> <div>102/00</div>				

表 4 (续)

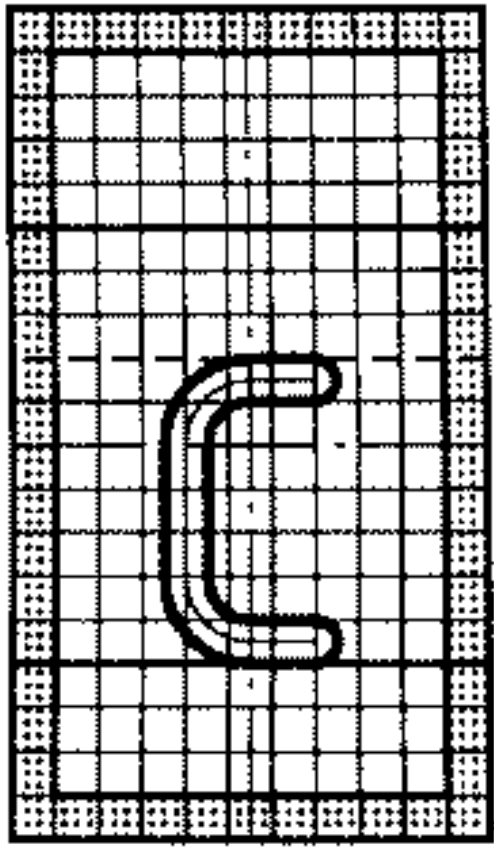
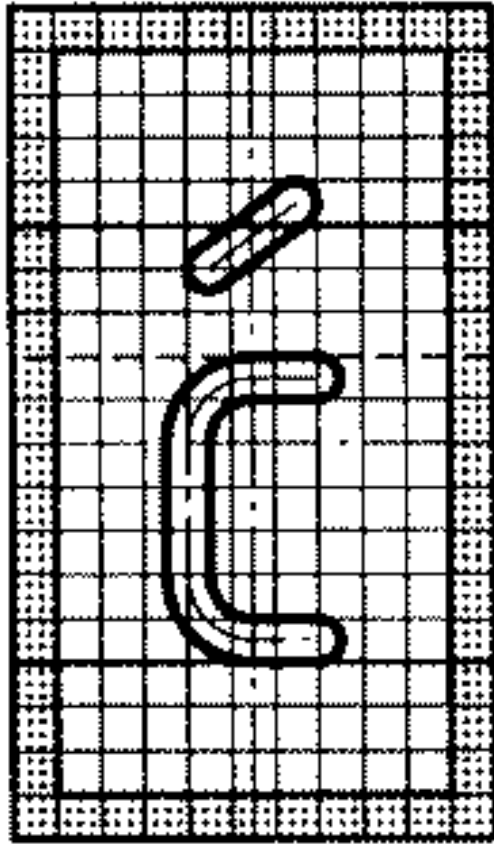
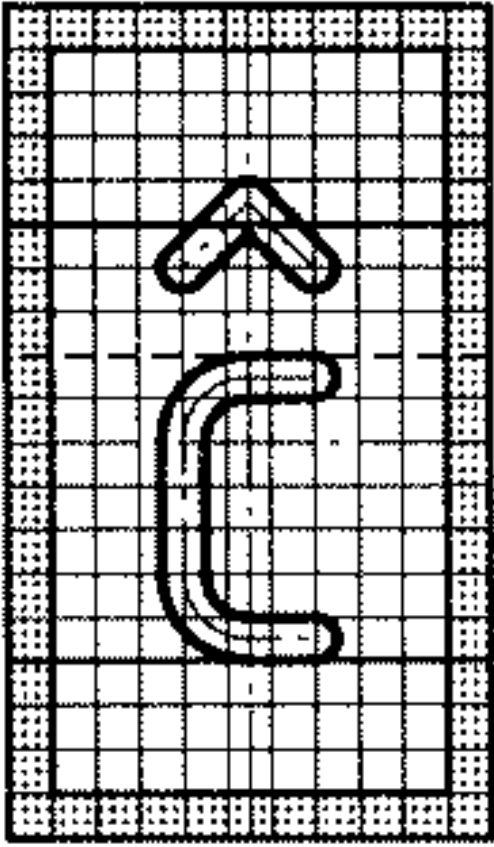
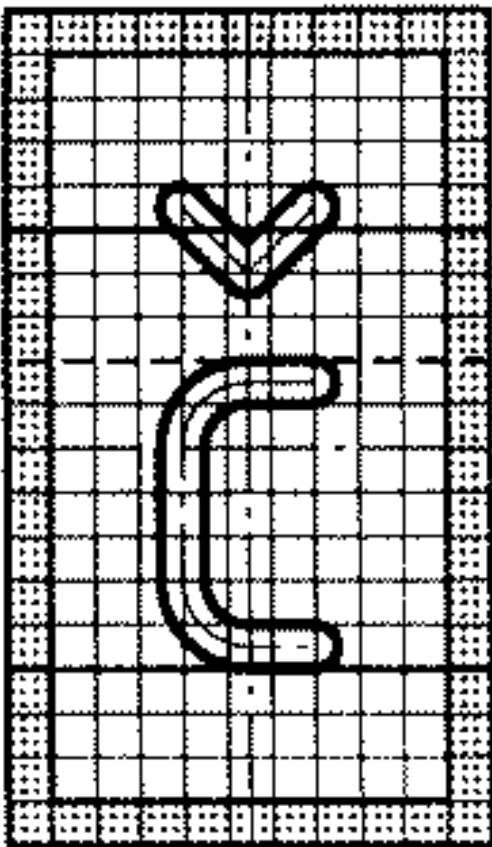
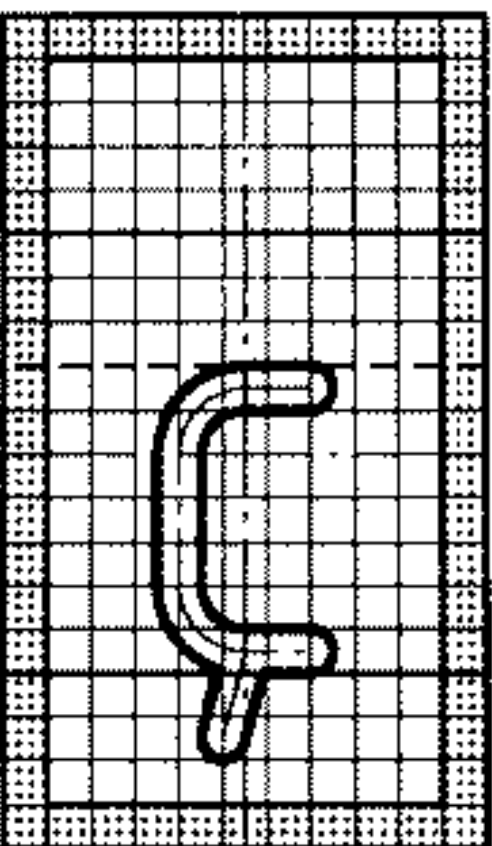
 103/00		 103/02	 103/03	
				 103/08
				 103/12

表 4 (续)

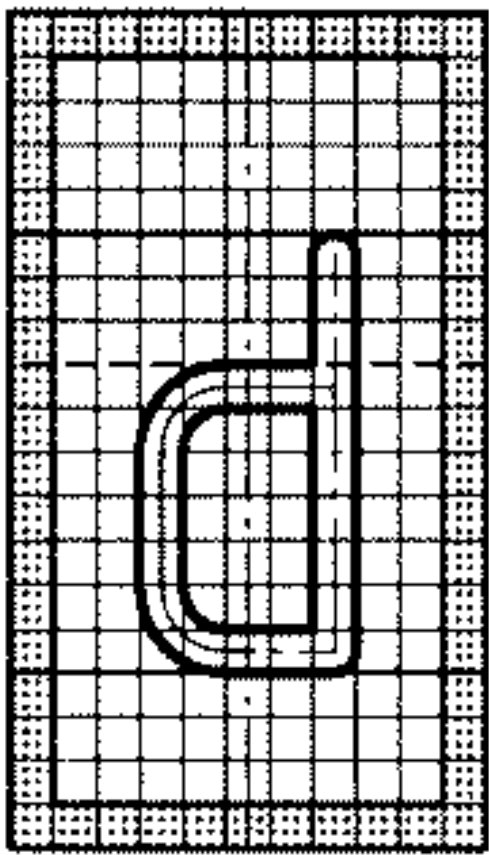
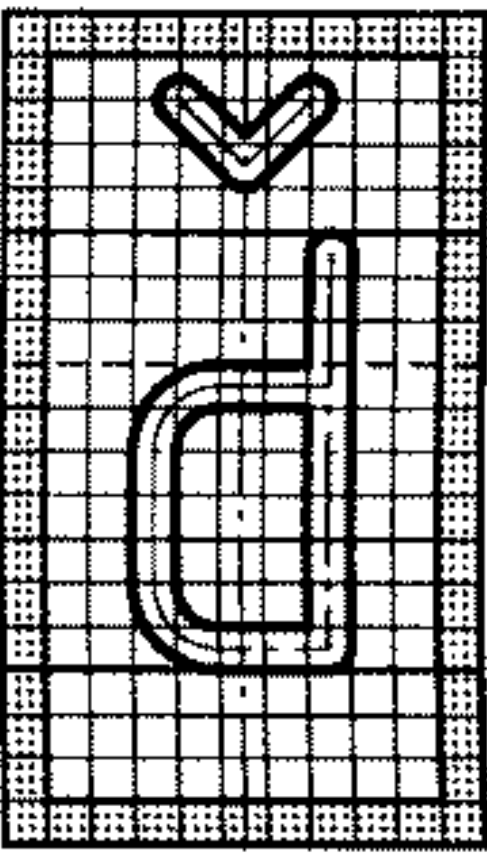
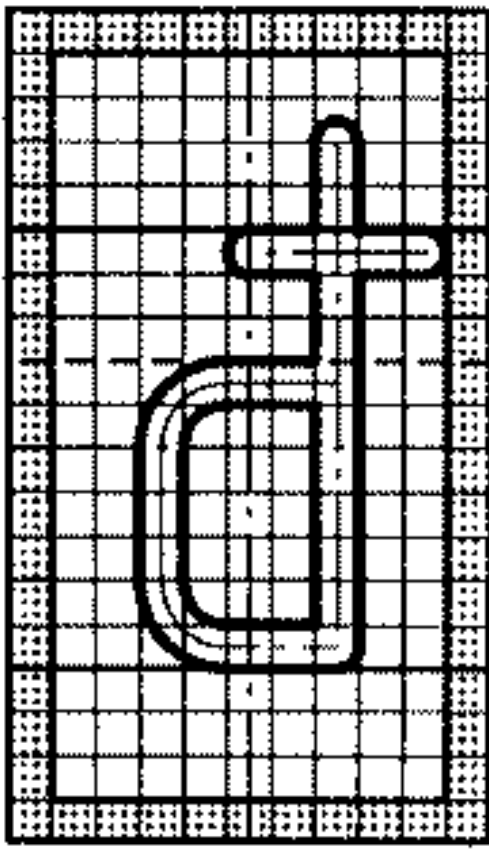
 104/00				
				 104/08
			 104/15	

表 4 (续)

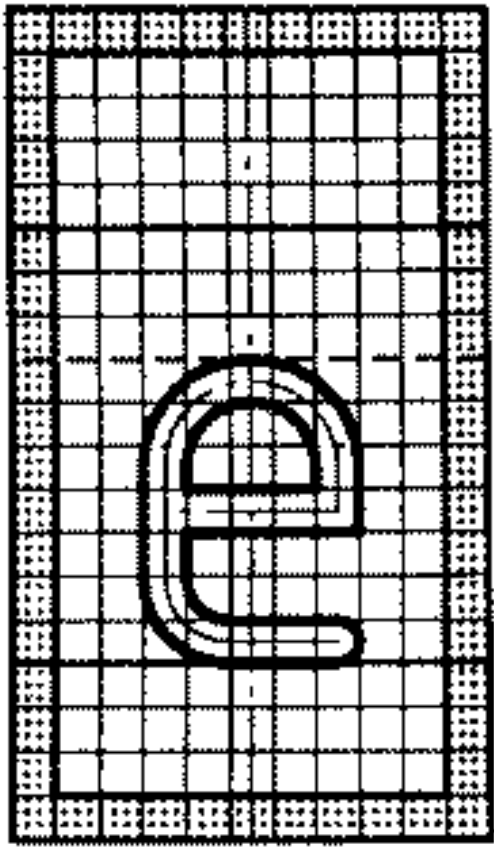
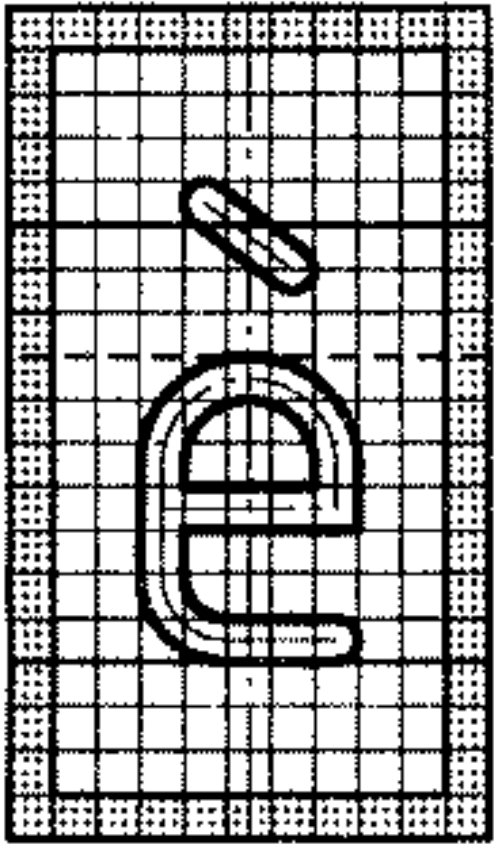
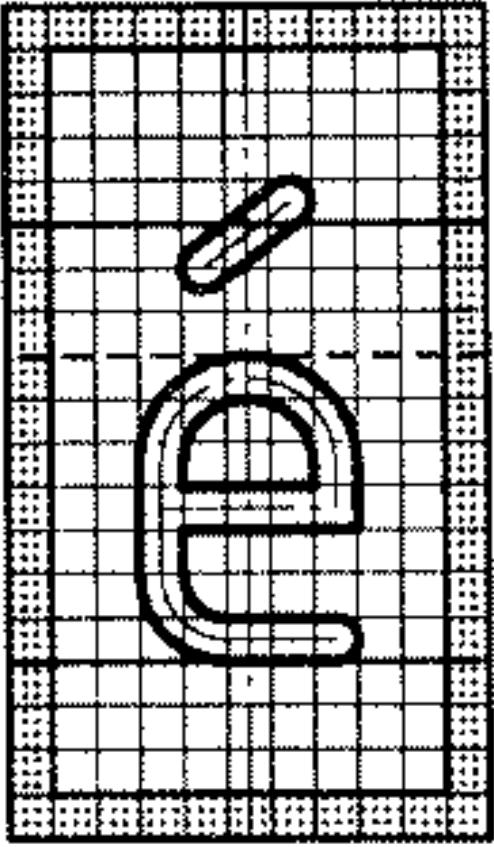
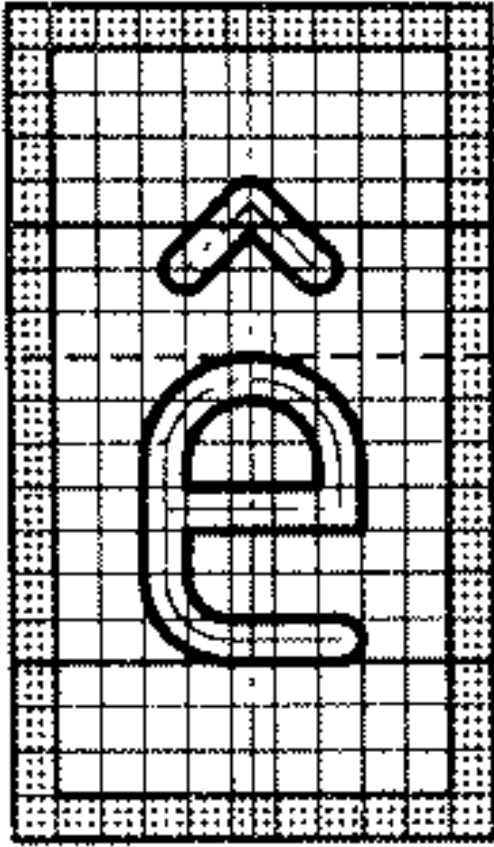
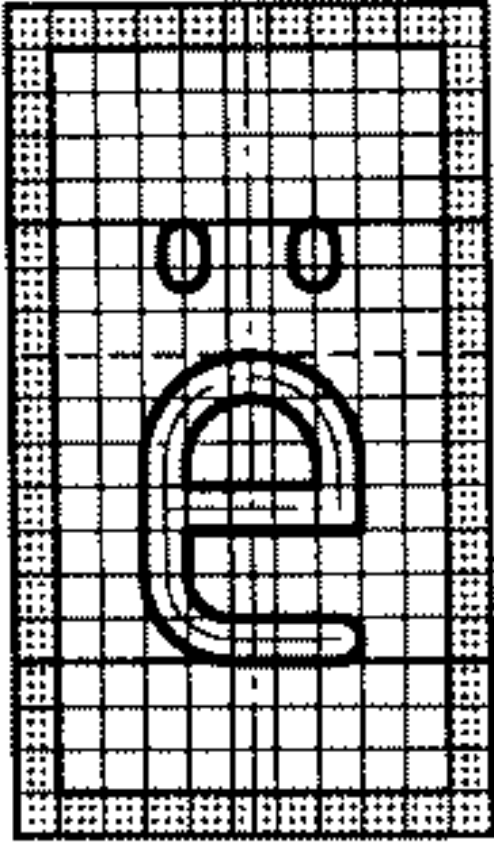
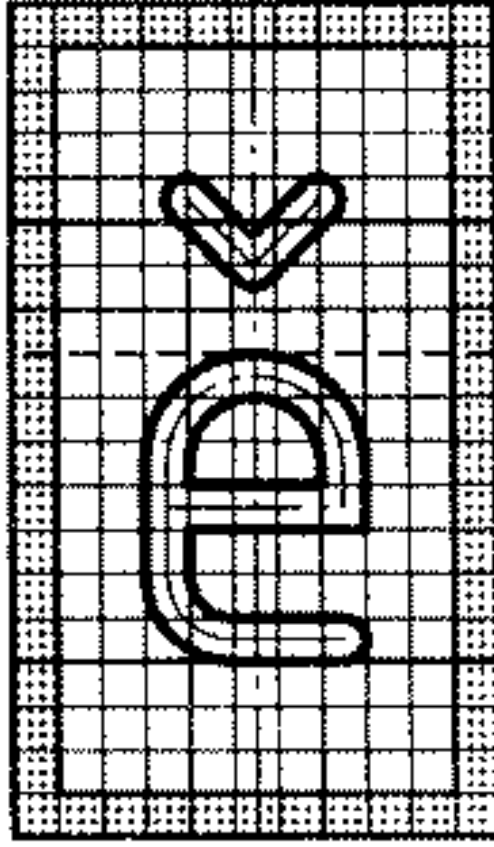
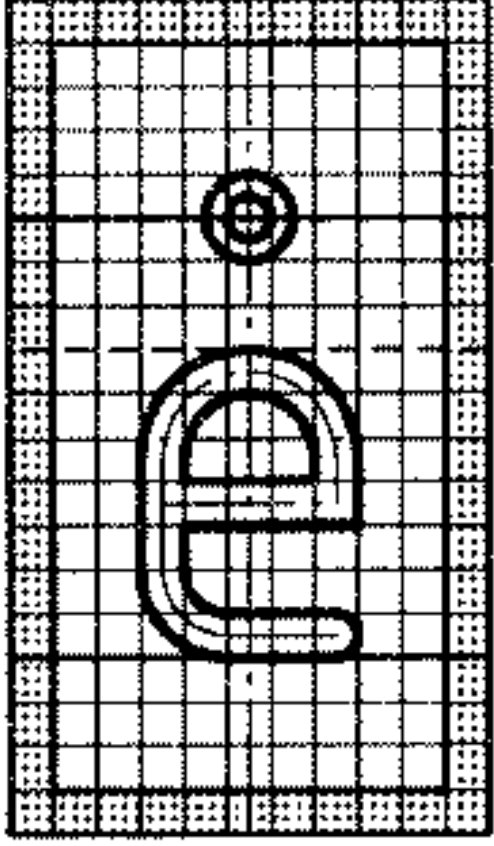
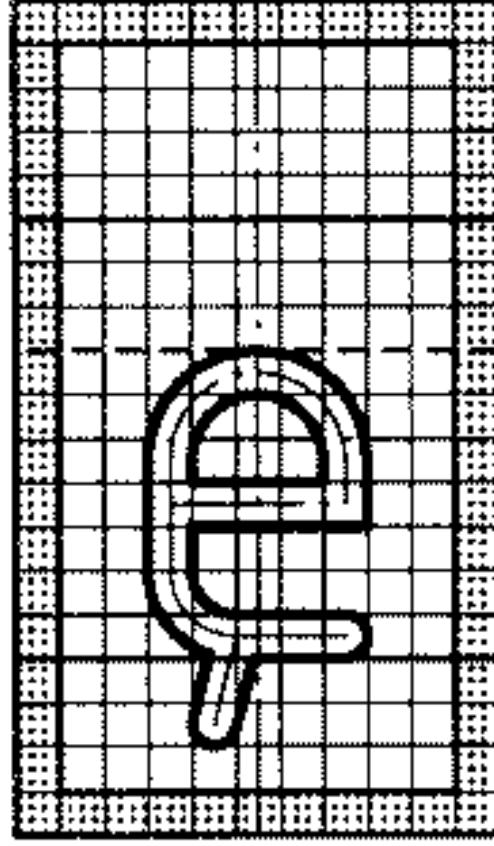
 105/00	 105/01	 105/02	 105/03	
	 105/05			 105/08
			 105/11	 105/12

表 4 (续)

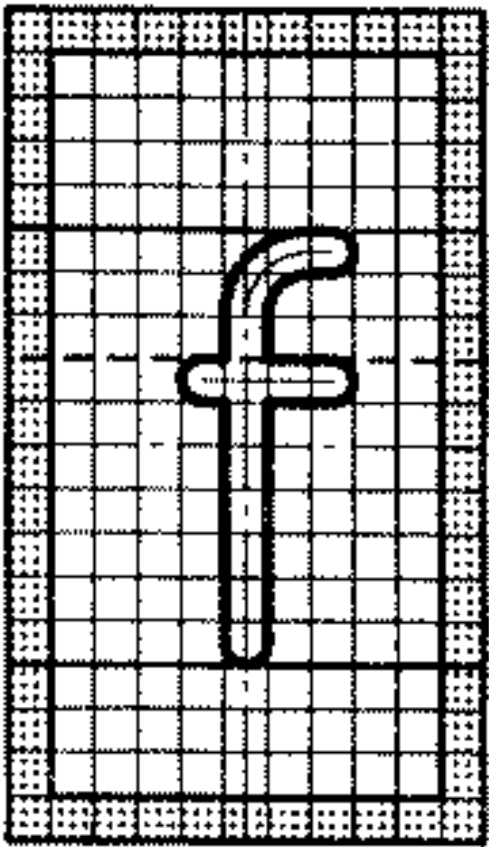
<div></div> <div>106/00</div>				

表 4 (续)

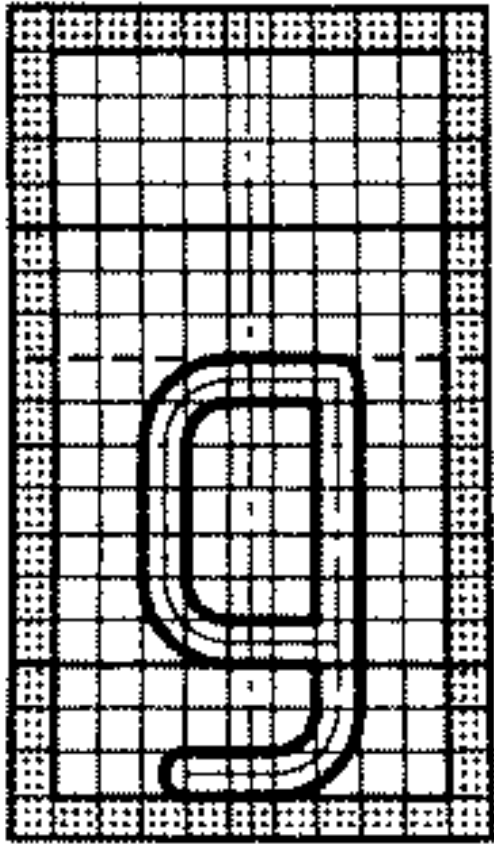
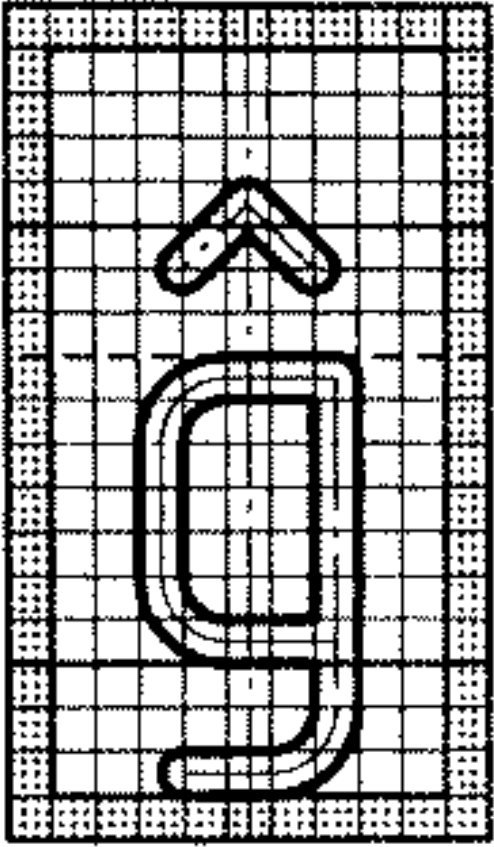
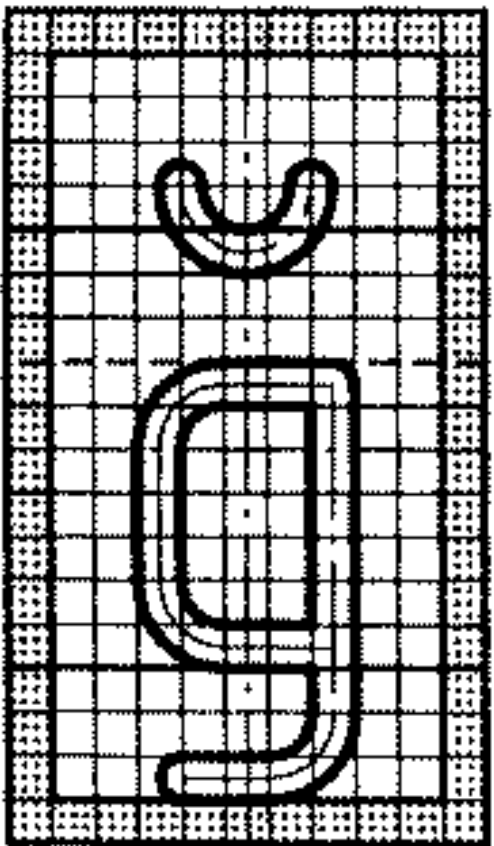
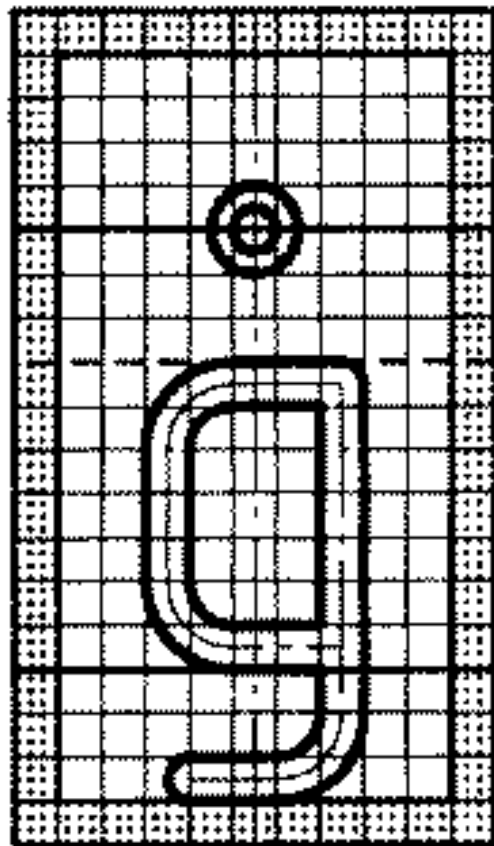
 107/00			 107/03	
	 107/09		 107/11	

表 4 (续)

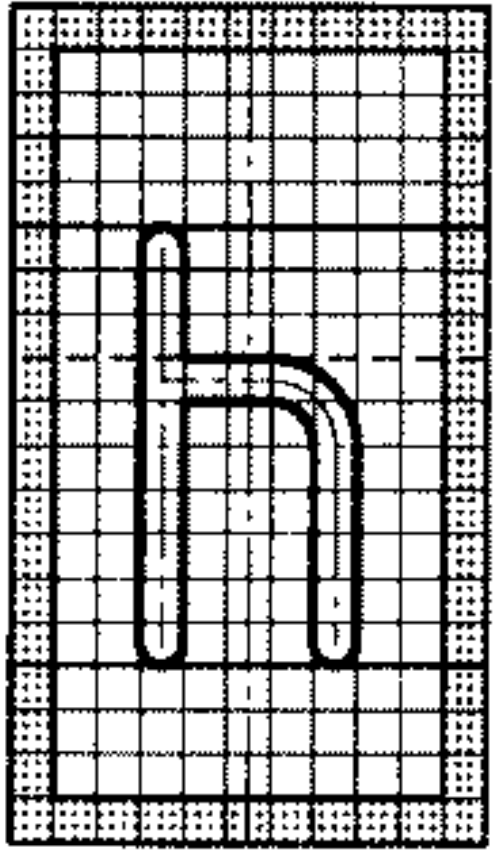
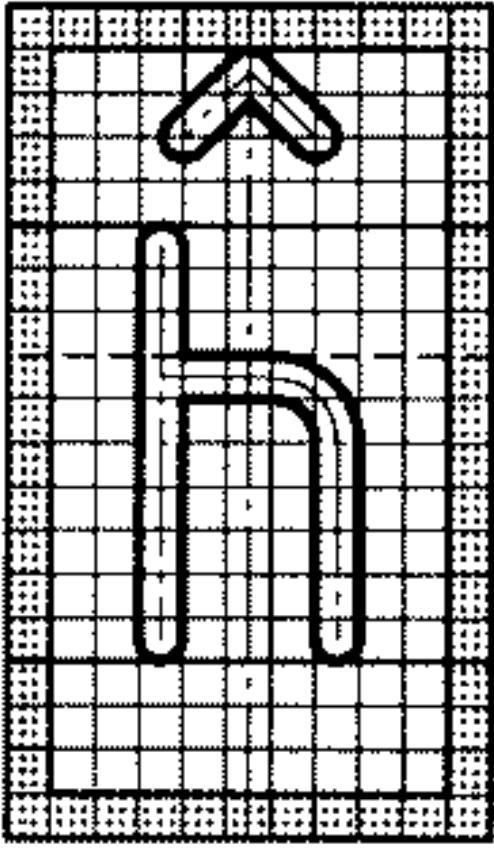
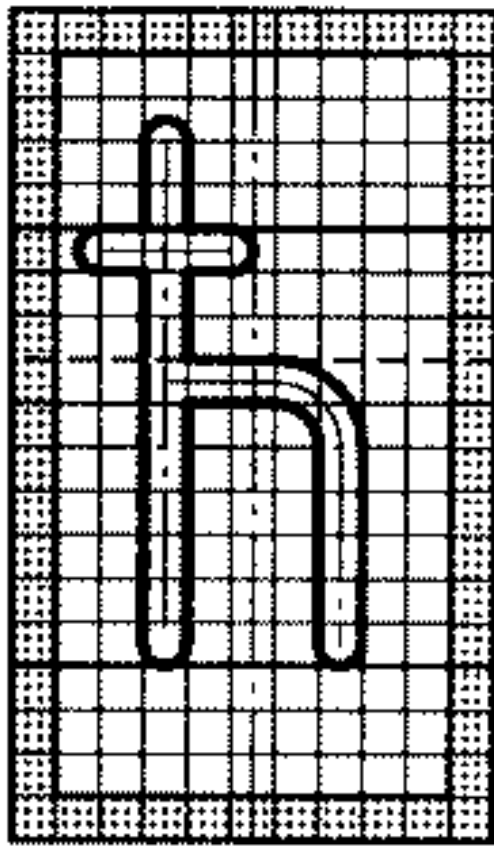
 108/00			 108/03	
			 108/15	

表 4 (续)

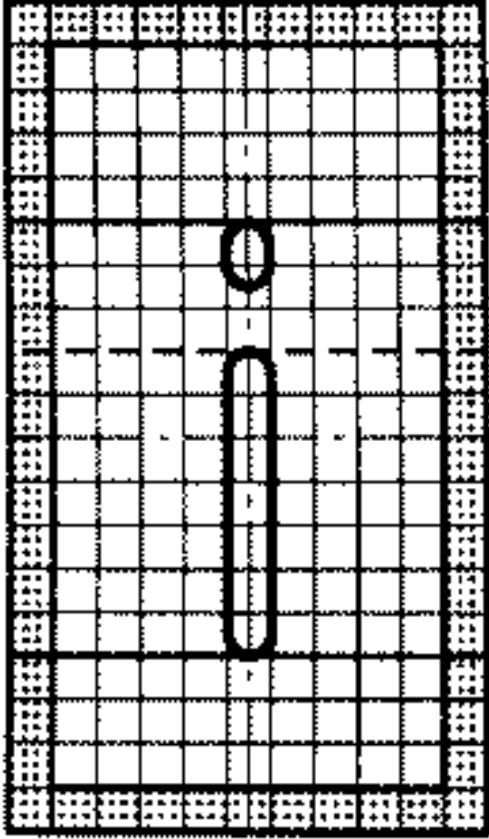
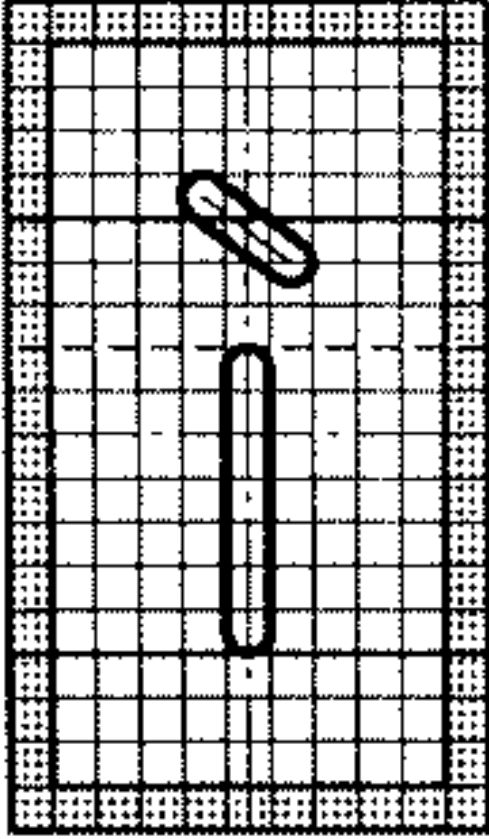
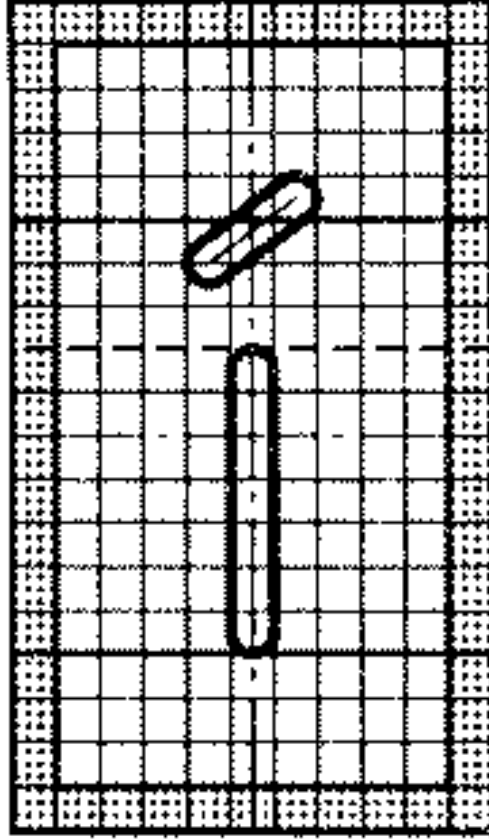
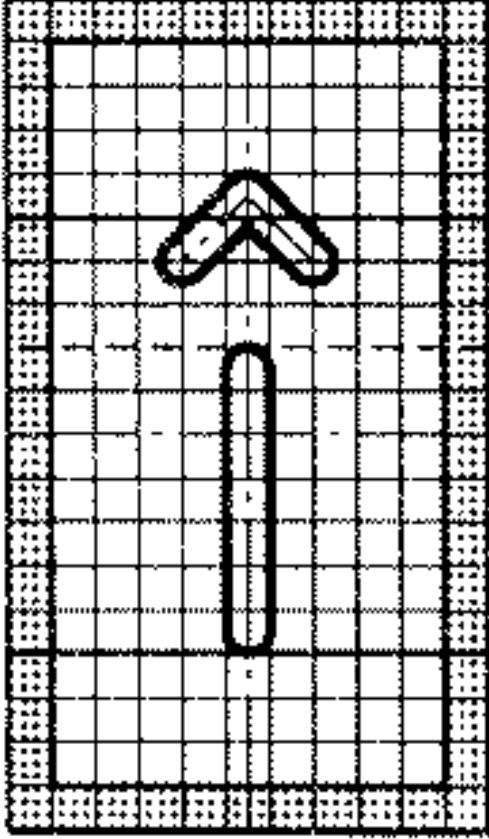
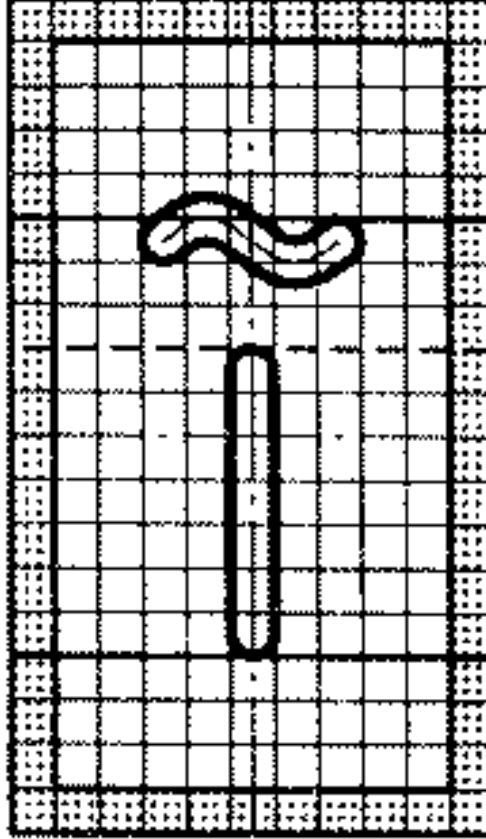
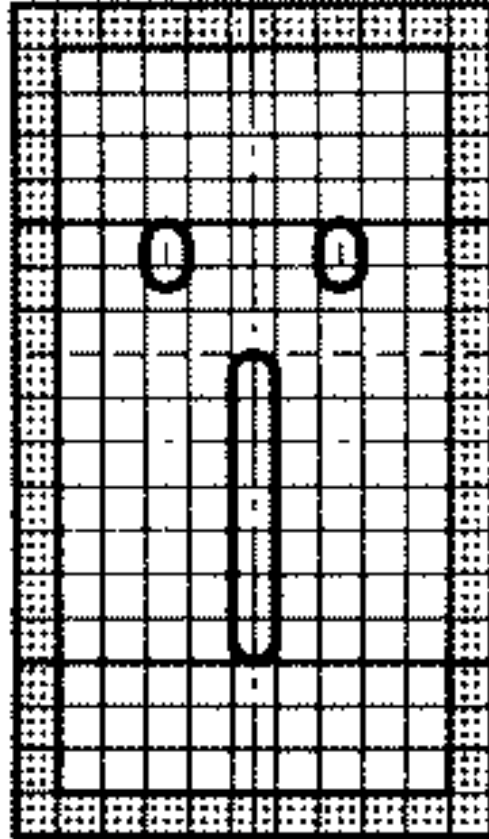
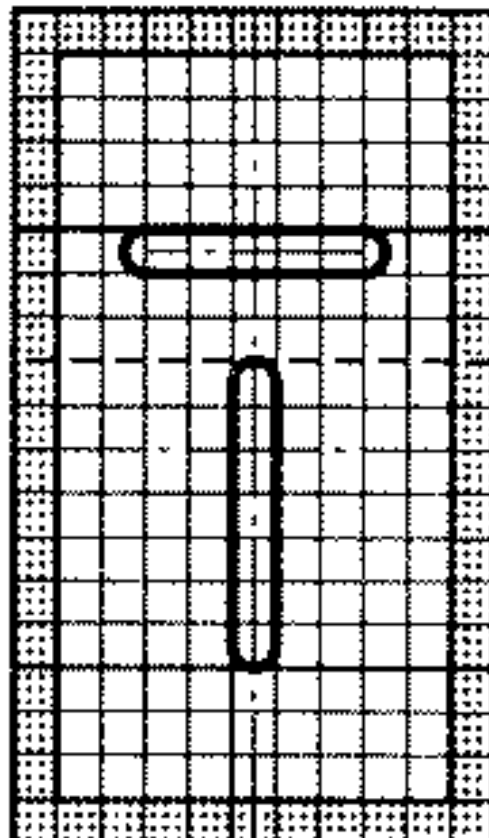
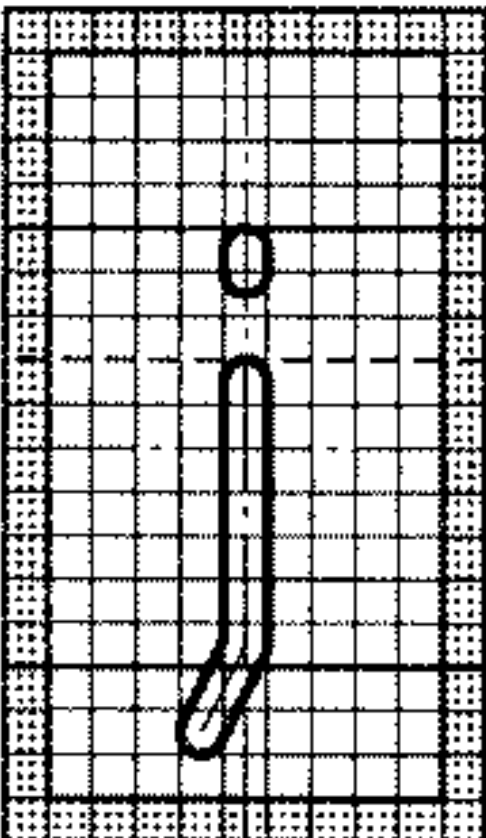
 109/00	 109/01	 109/02	 109/03	 109/04
	 109/05			
		 109/10		 109/12

表 4 (续)

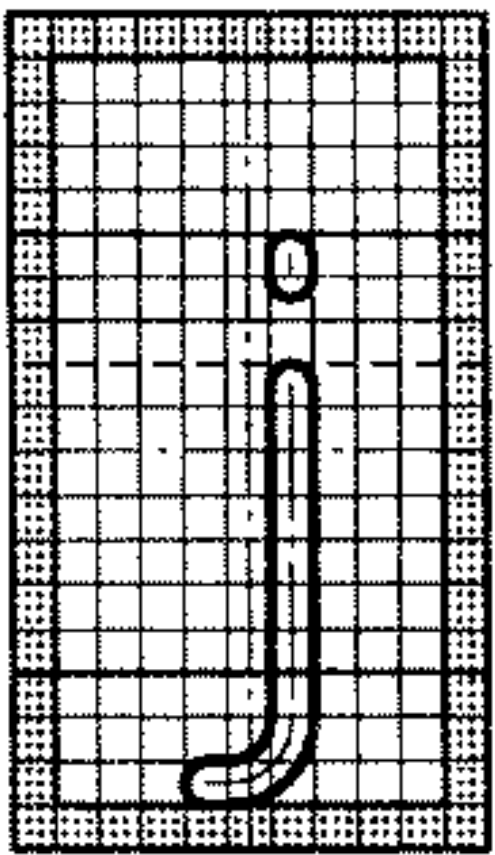
<div> 110/00</div>				

表 4 (续)

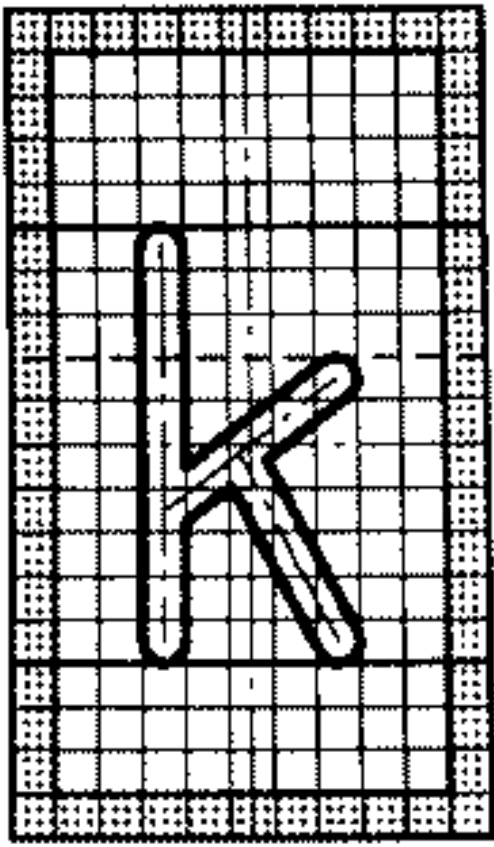
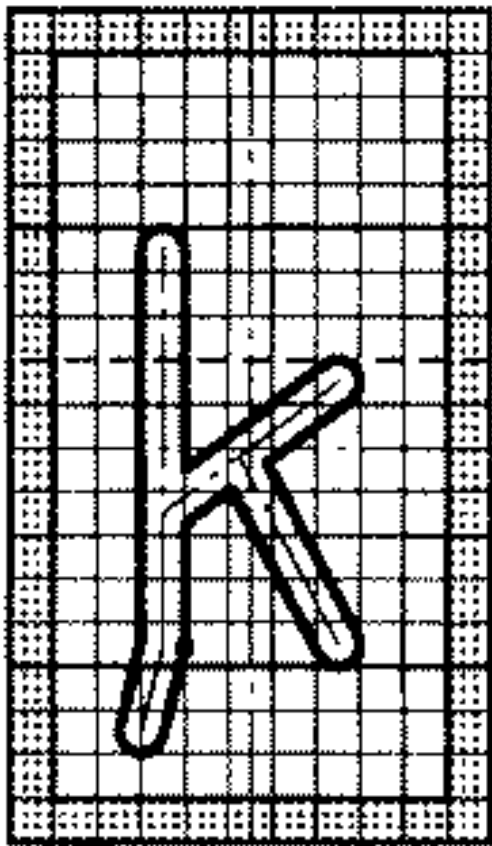
 111/00				
				 111/00

表 4 (续)

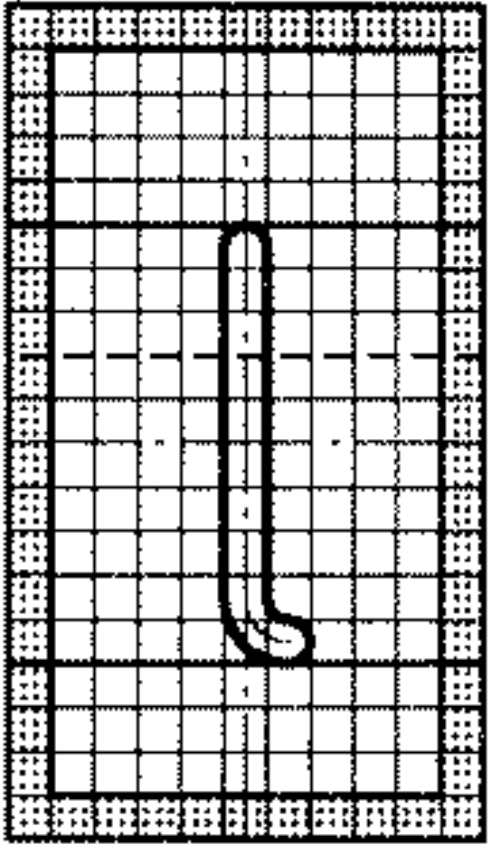
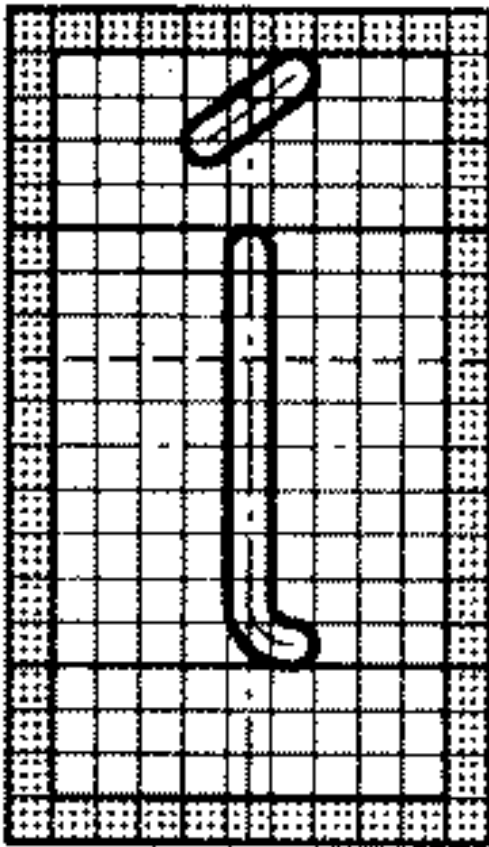
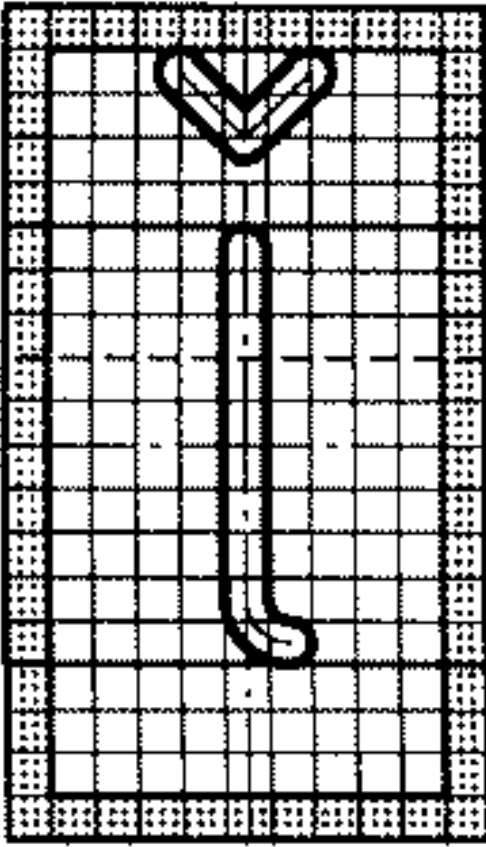
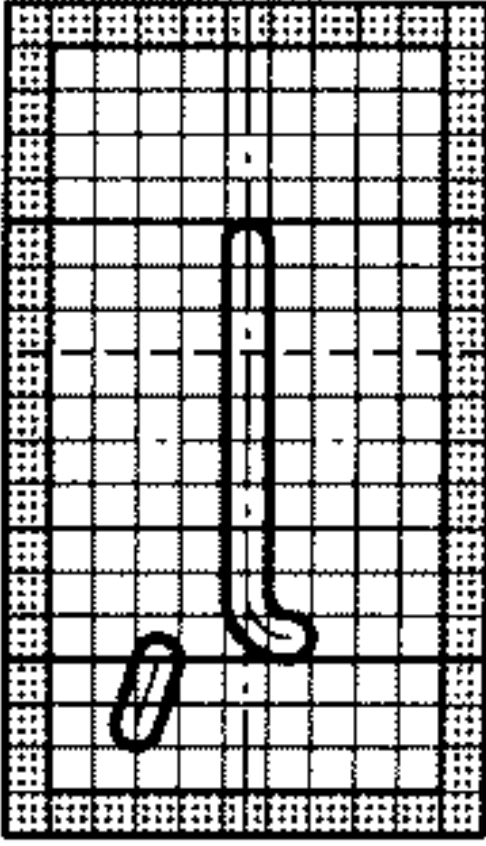
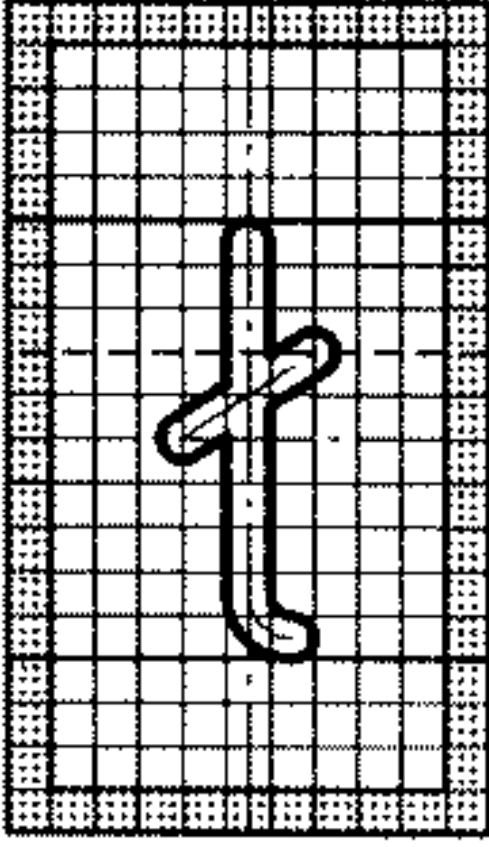
 112/00		 112/02		
				 112/08
				 112/12
	 112/13			

表 4 (续)

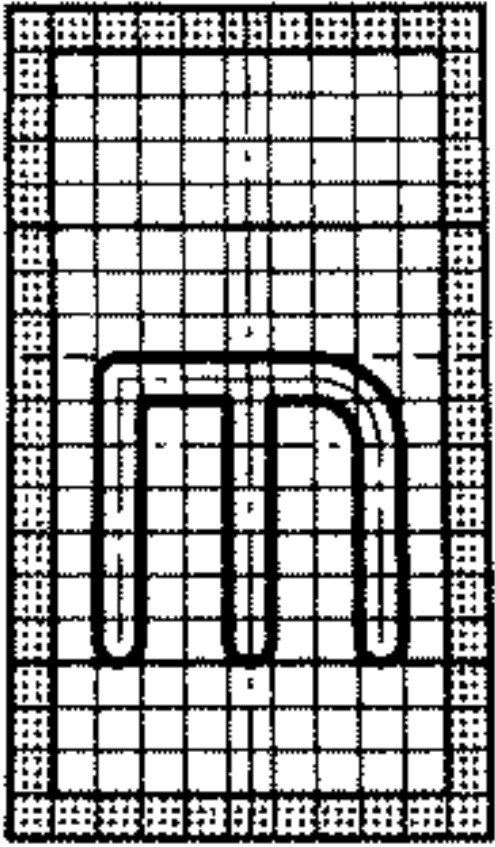
<div><p>113/00</p></div>				

表 4 (续)

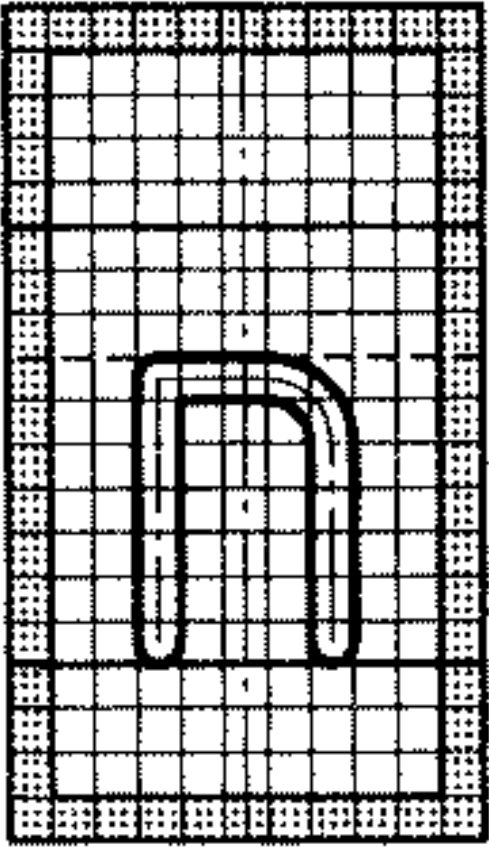
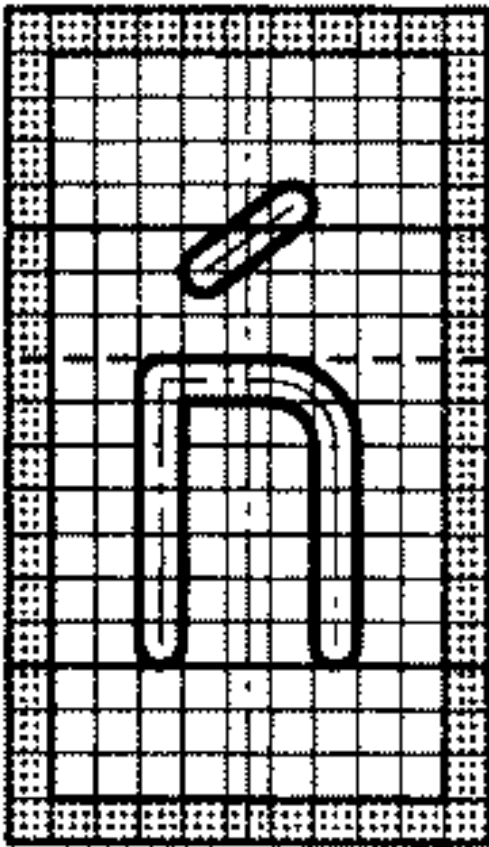
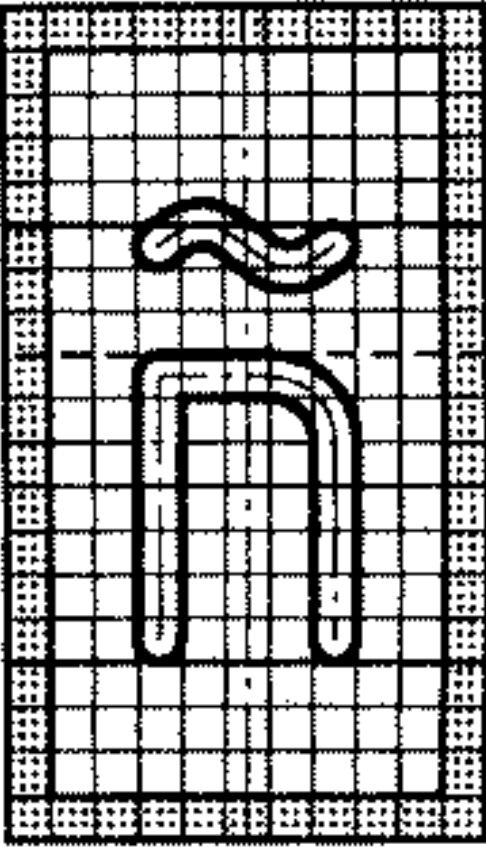
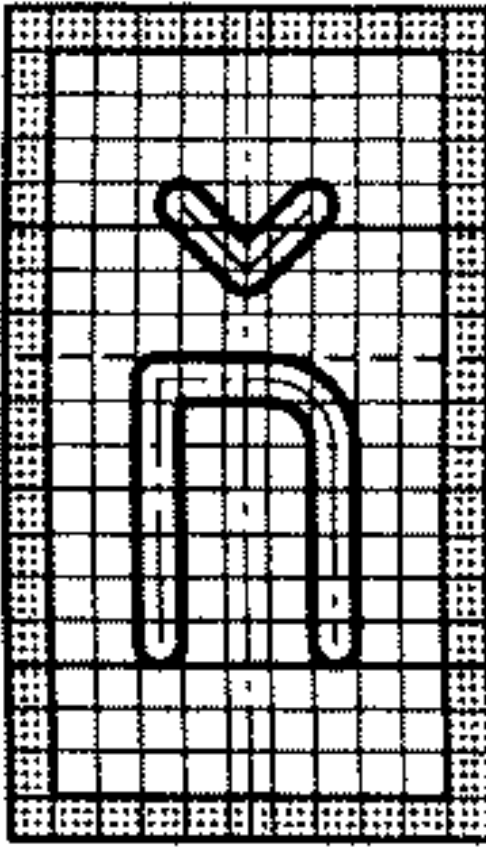
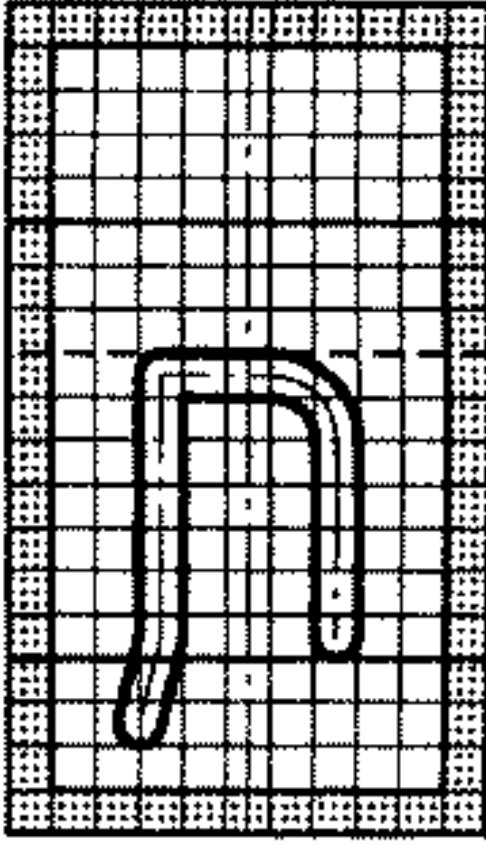
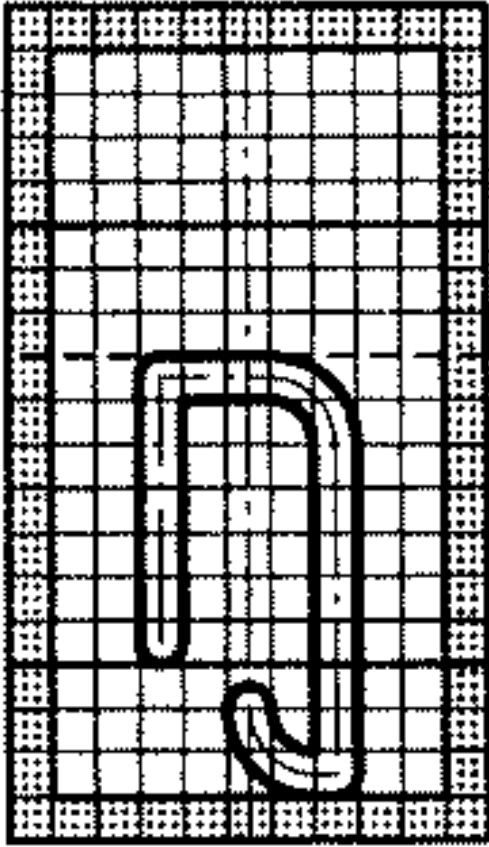
				
114/00		114/02		114/04
				
				114/08
				
				114/12
				
		114/18		

表 4 (续)

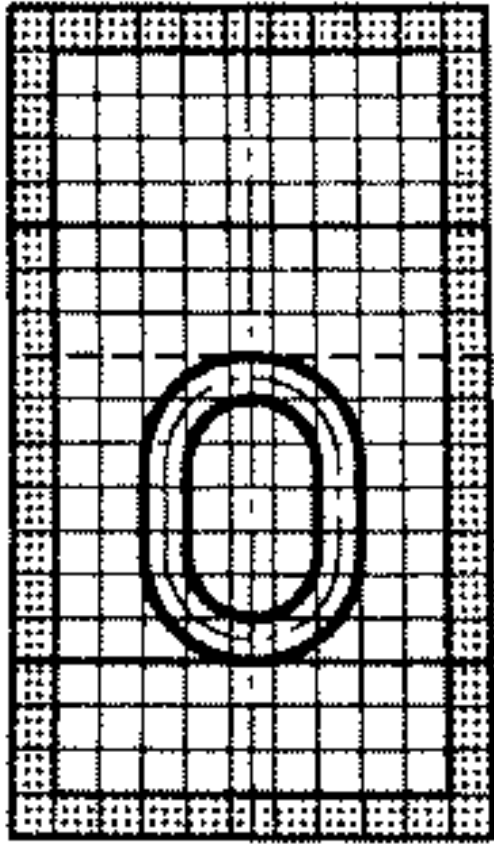
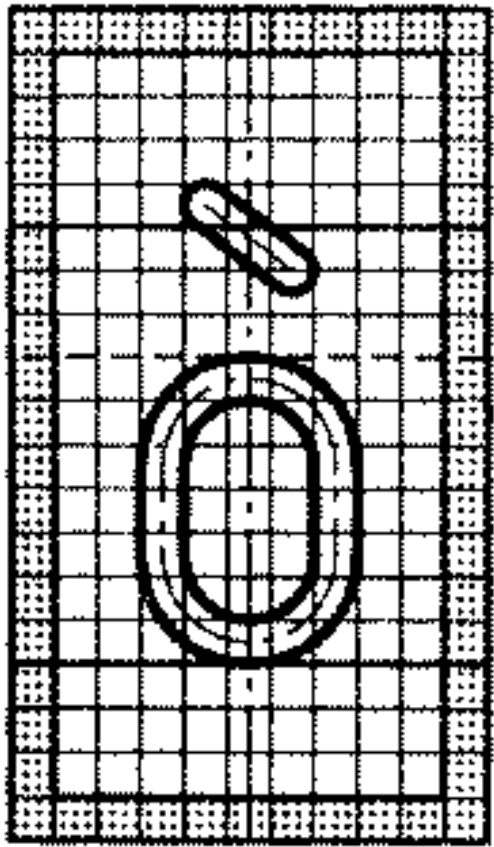
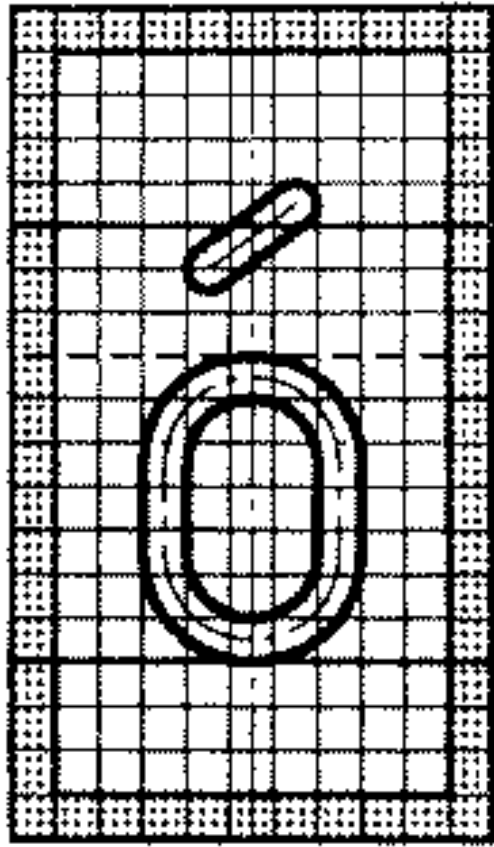
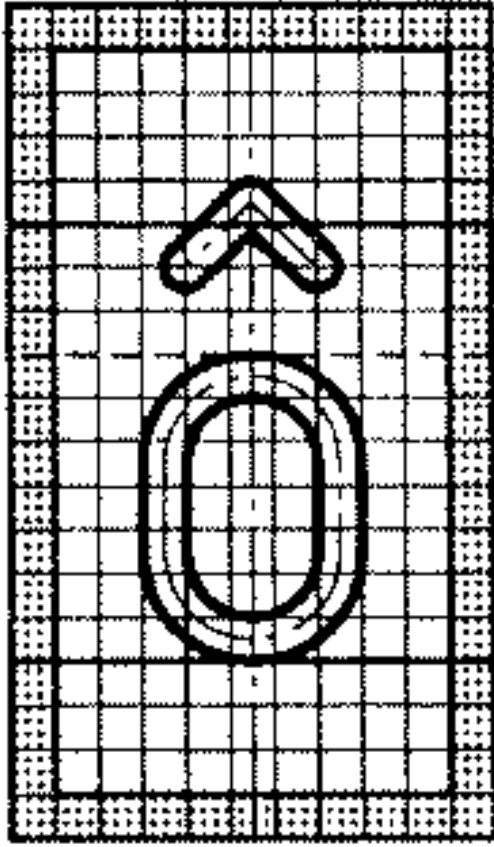
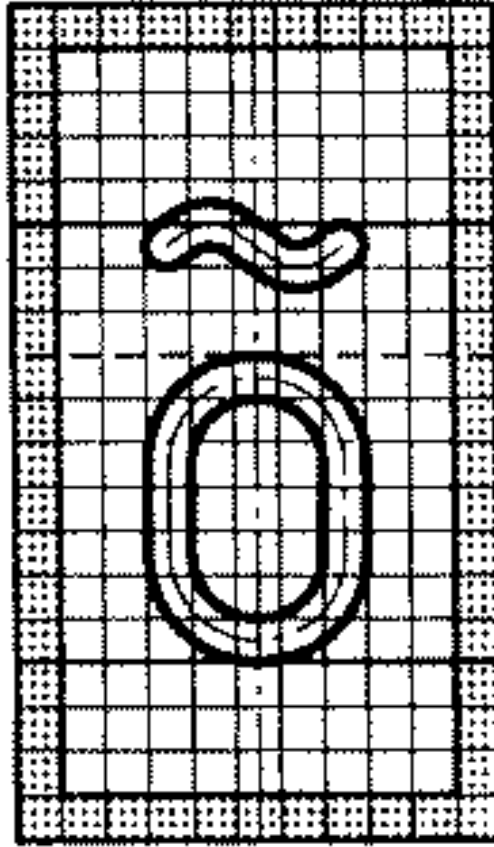
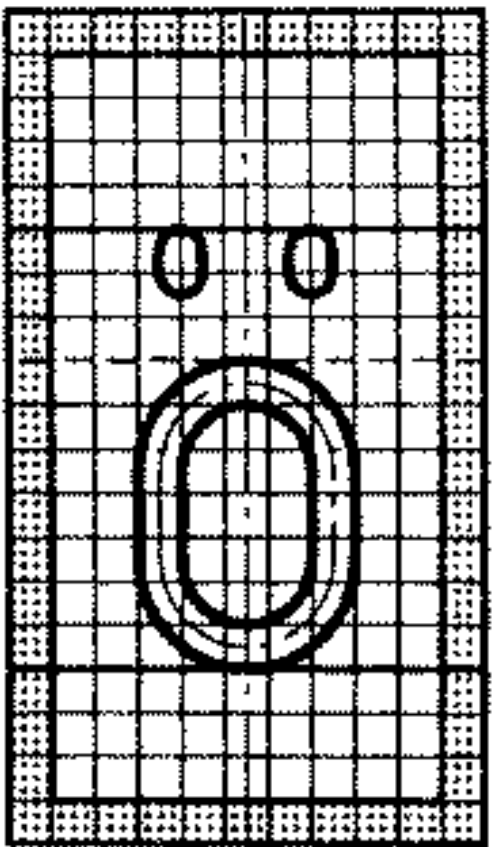
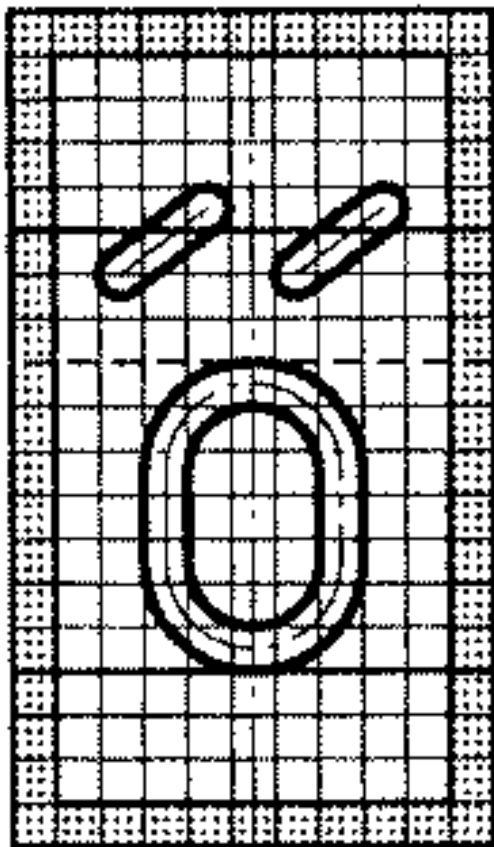
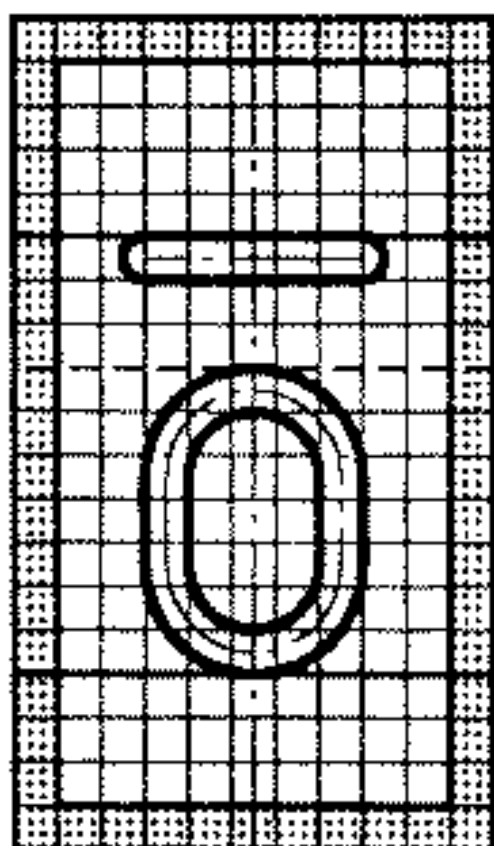
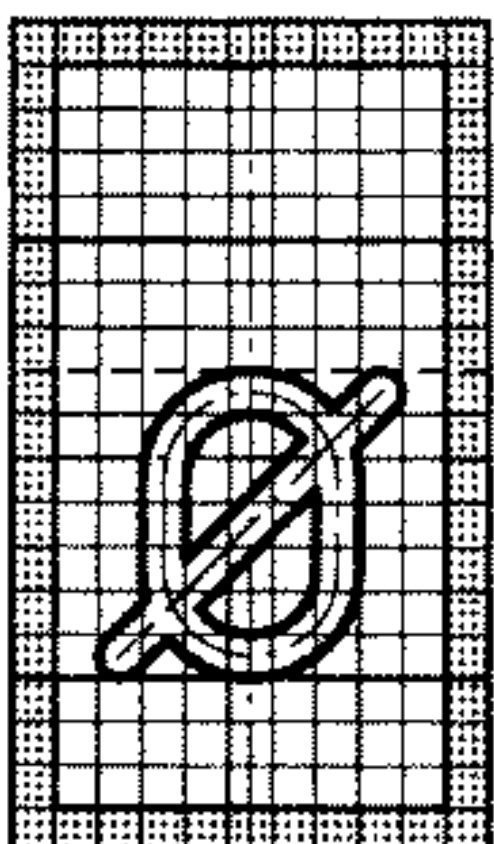
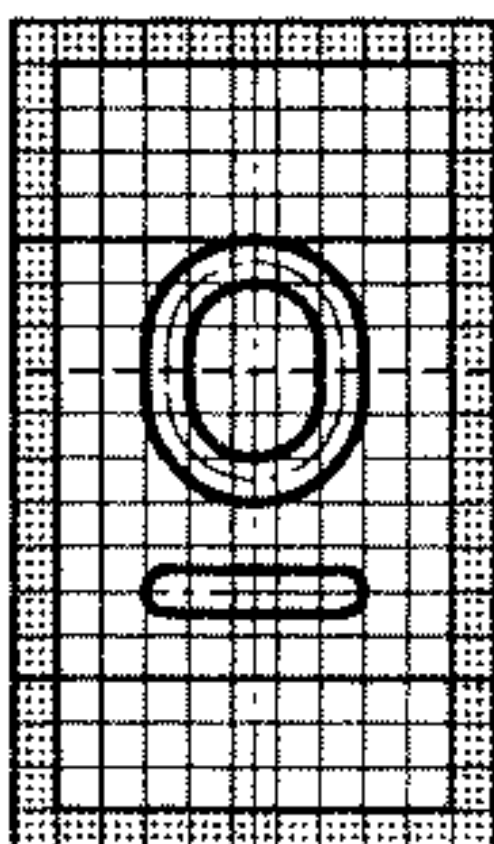
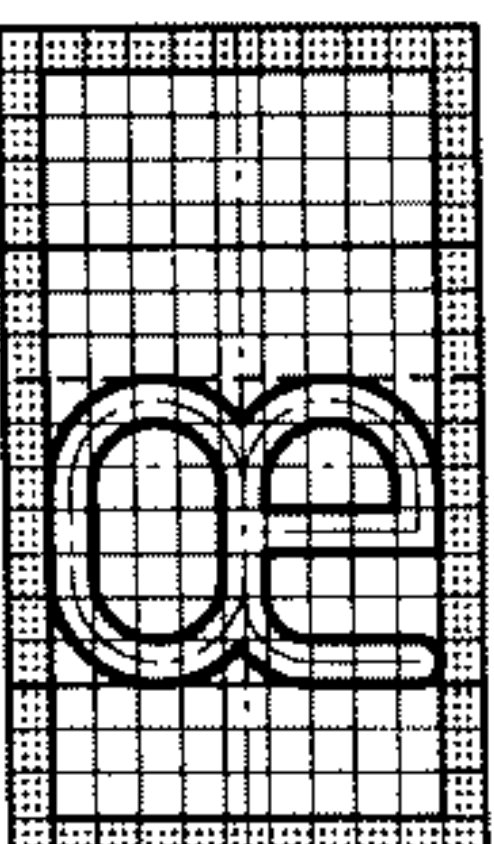
 115/00	 115/01	 115/02	 115/03	 115/04
	 115/05		 115/07	
		 115/10		
	 115/13			 115/16
	 115/17			

表 4 (续)

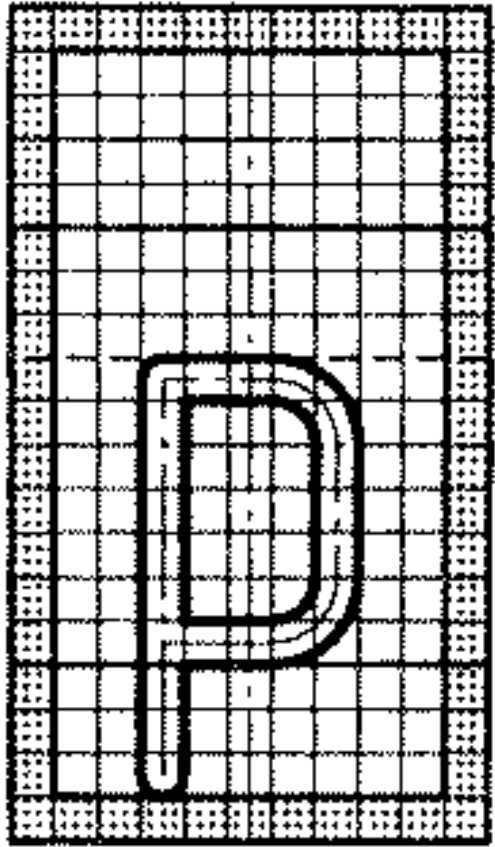
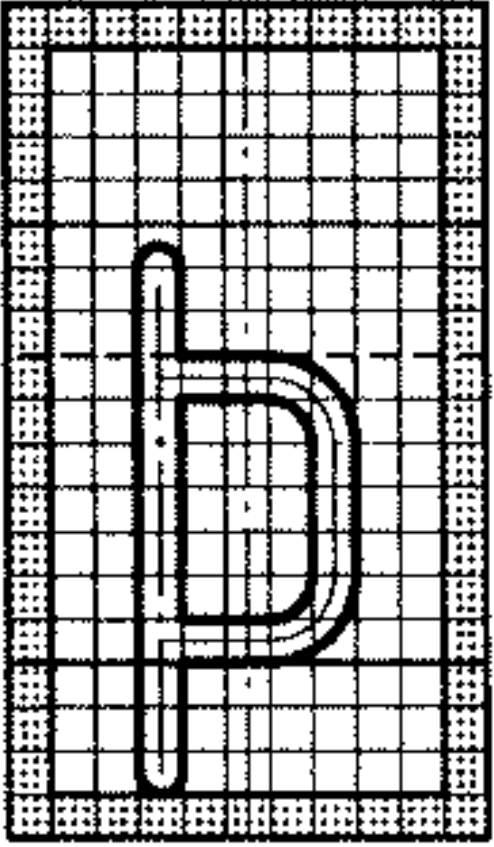
<div></div> <div>116/00</div>				
		<div></div> <div>116/18</div>		

表 4 (续)

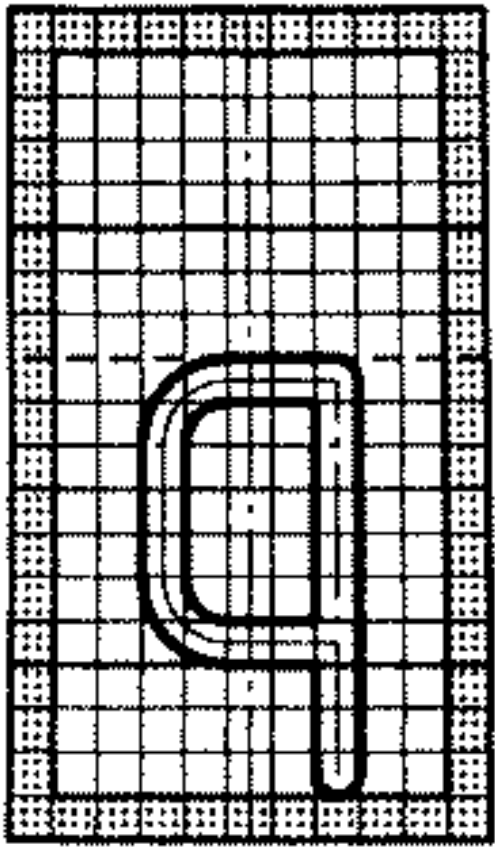
<div></div> <div>117/00</div>				

表 4 (续)

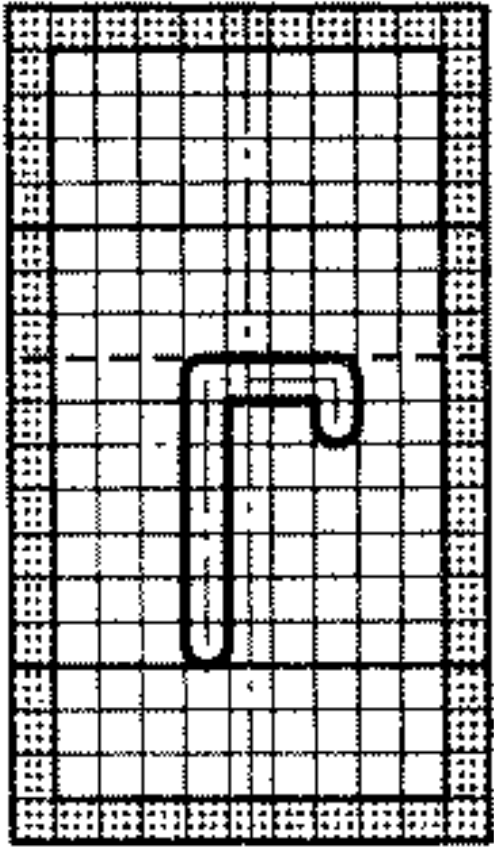
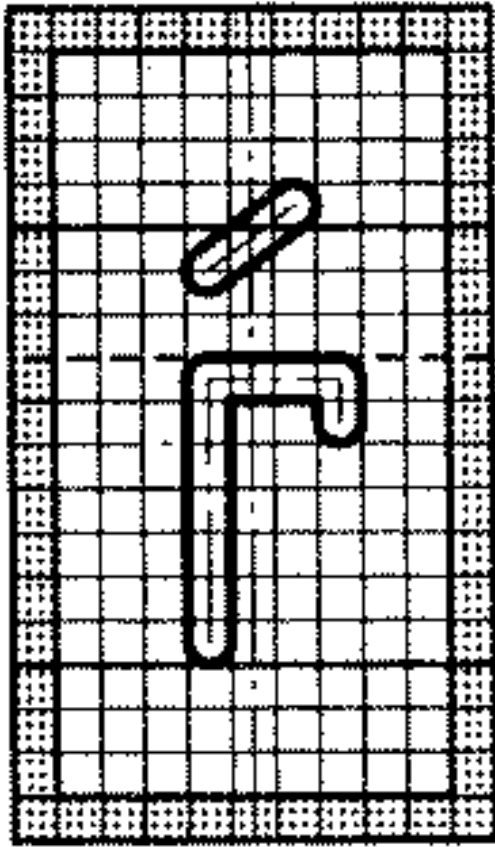
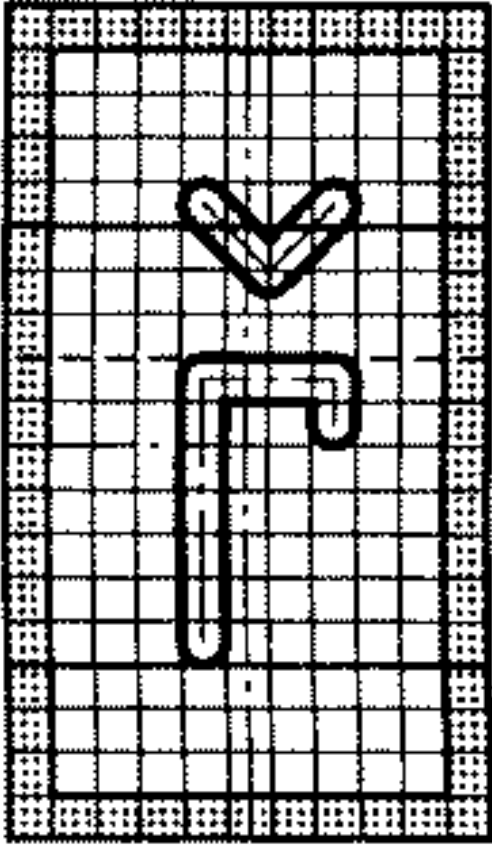
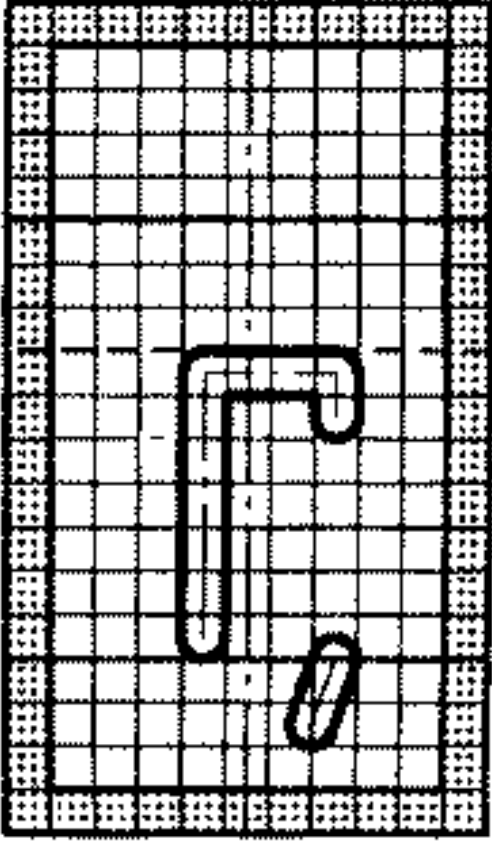
 118/00		 118/02		
				 118/08
				 118/12

表 4 (续)

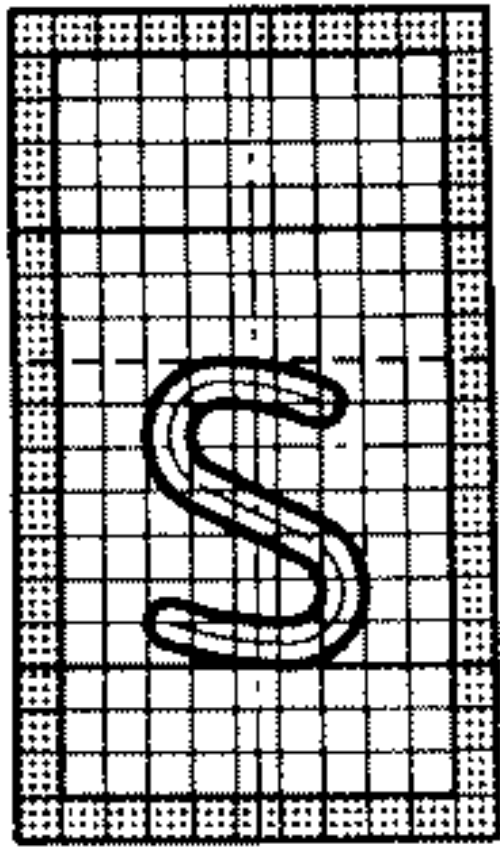
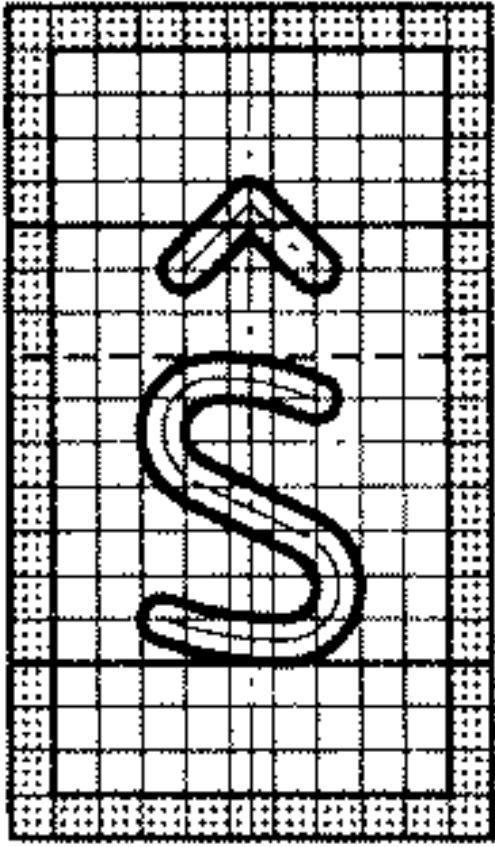
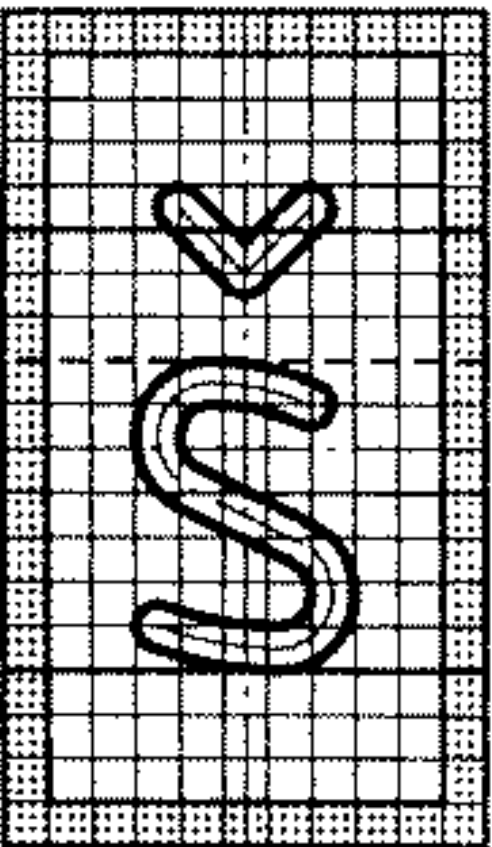
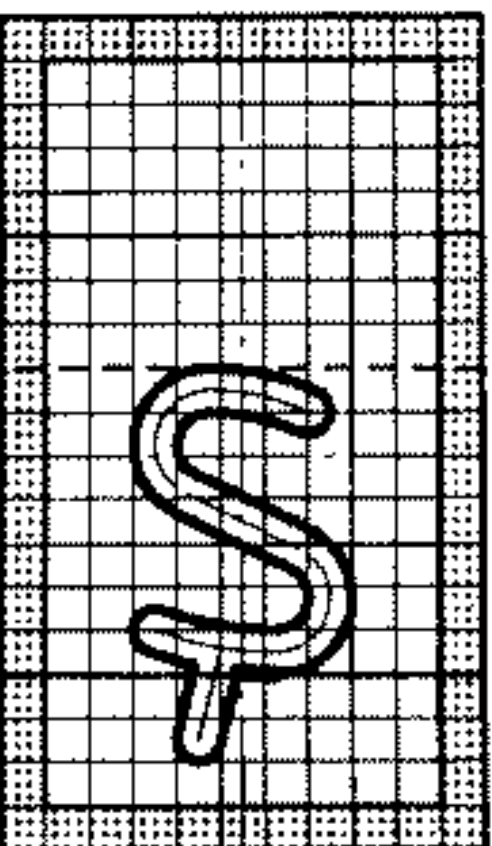
 119/00			 119/03	
				 119/08
				 119/12

表 4 (续)

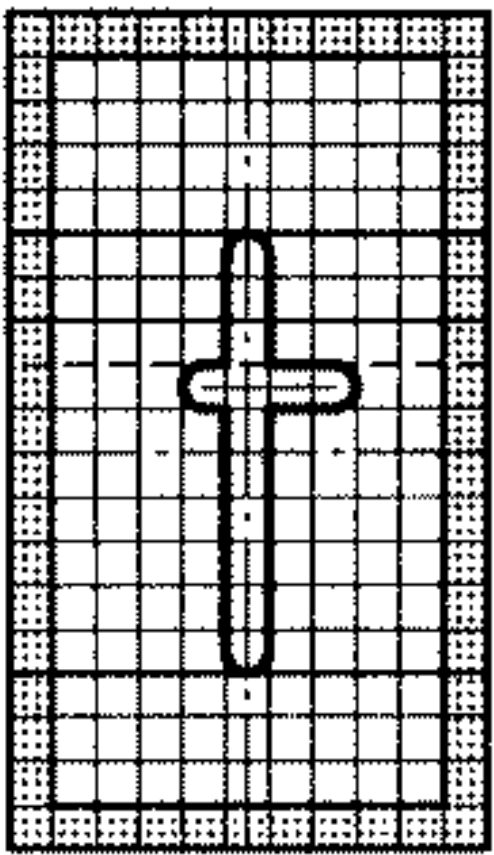
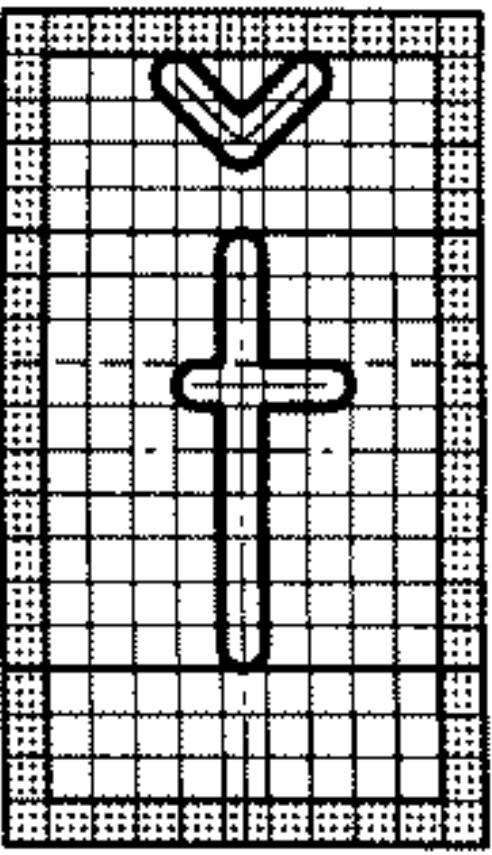
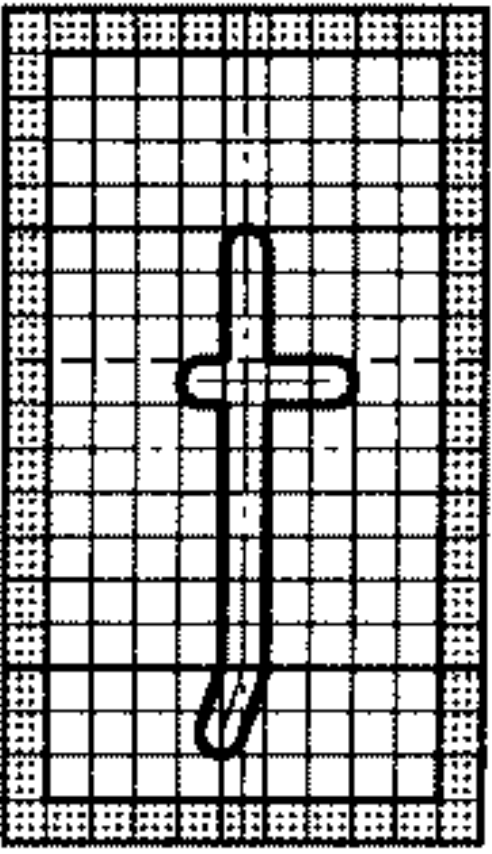
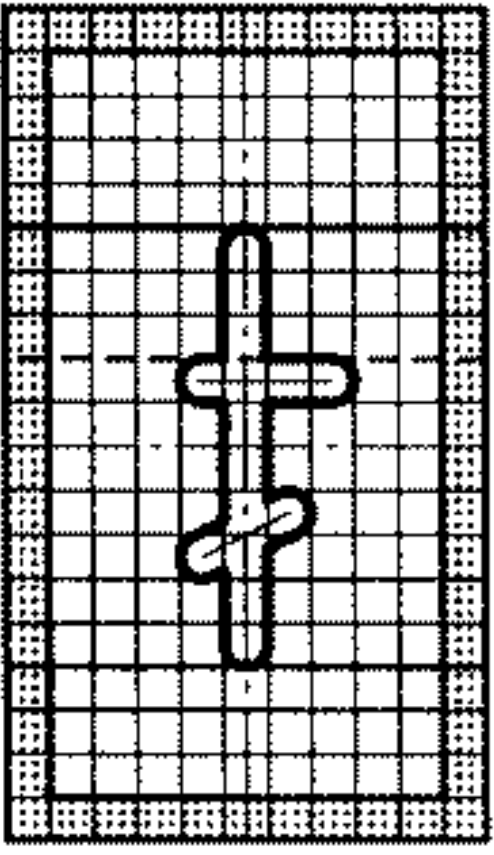
 120/00				
				 120/08
				 120/12
		 120/14		

表 4 (续)

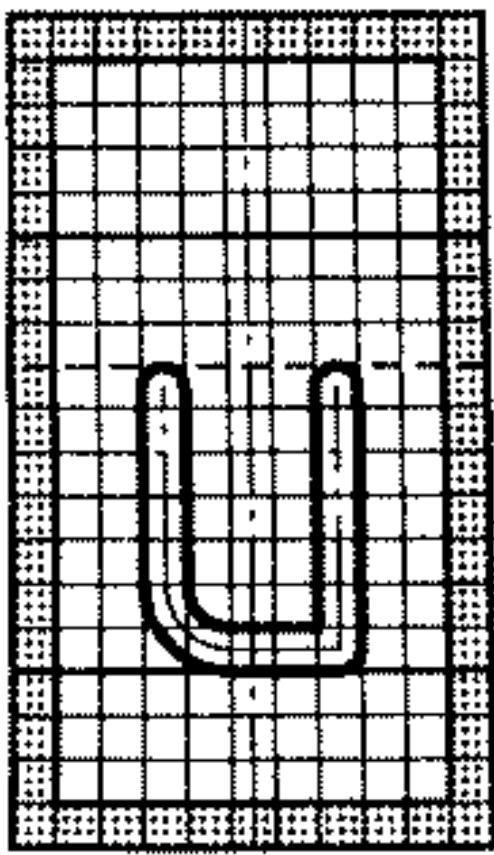
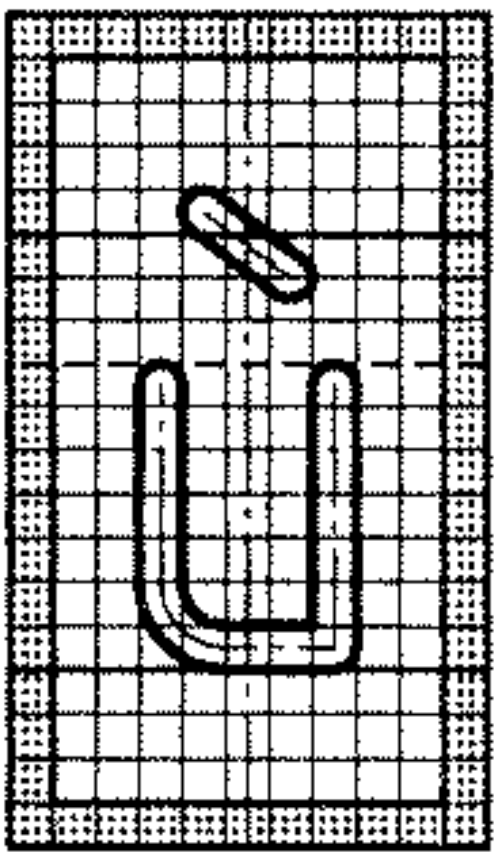
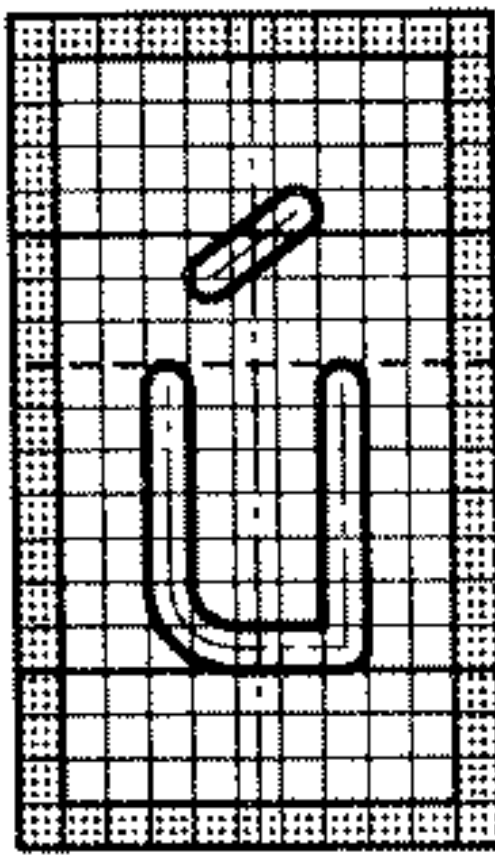
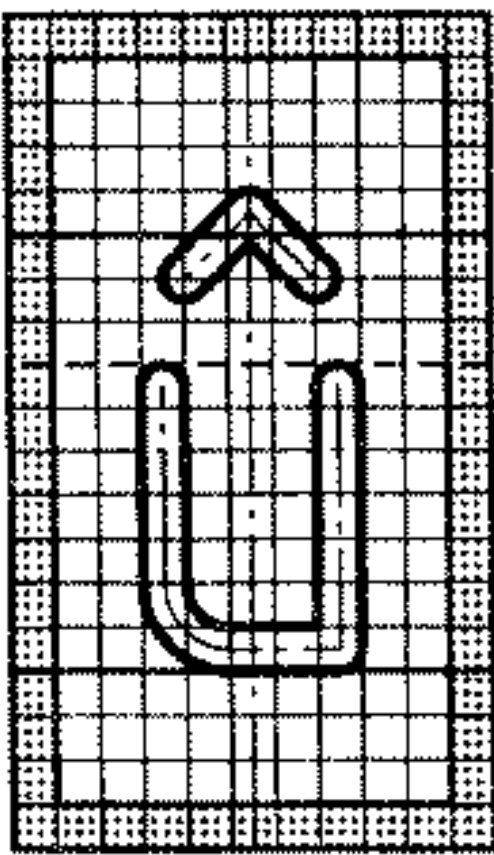
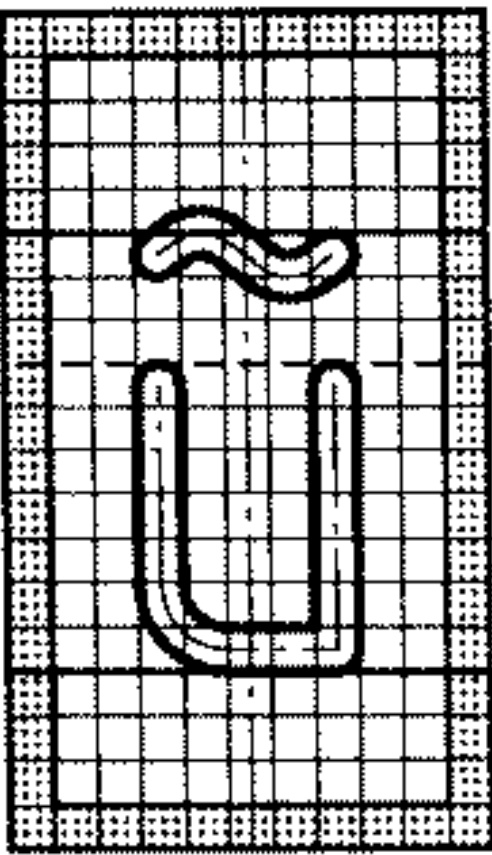
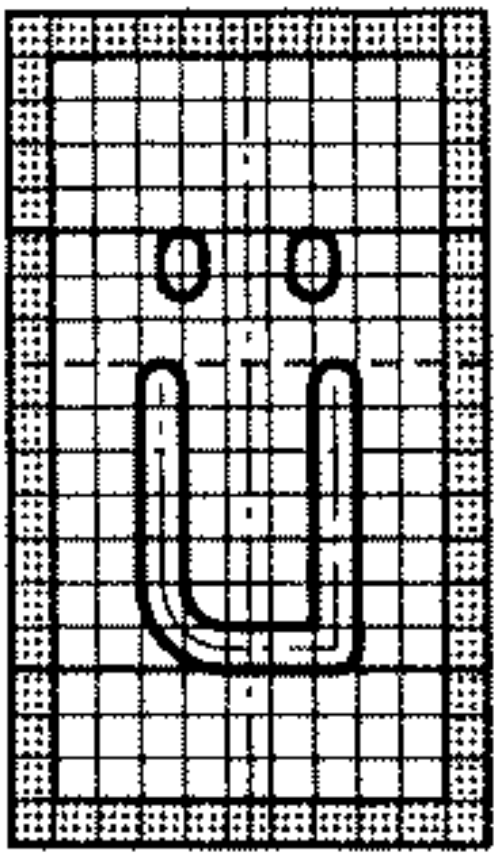
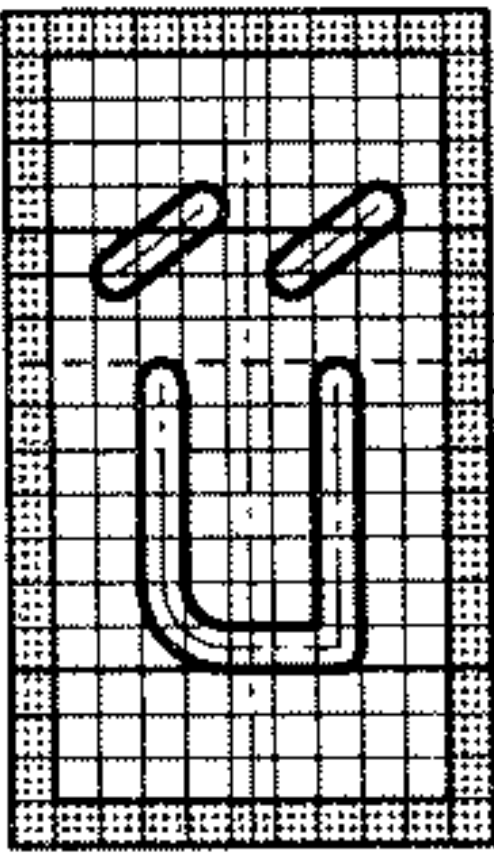
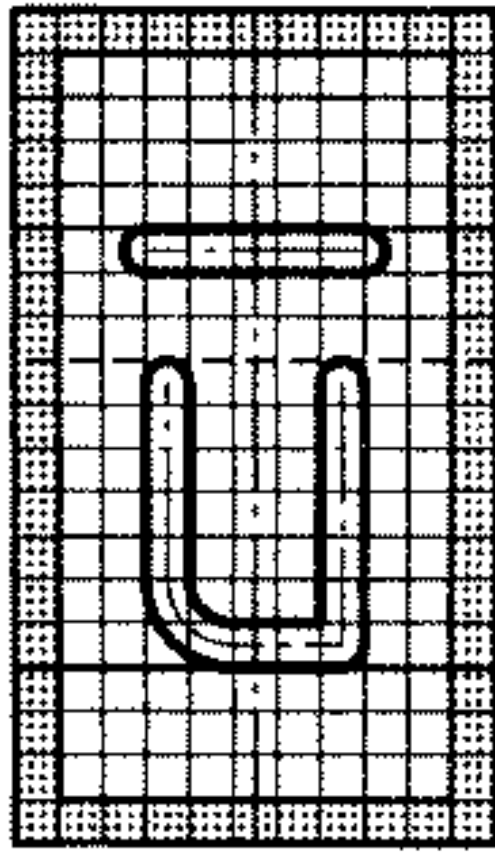
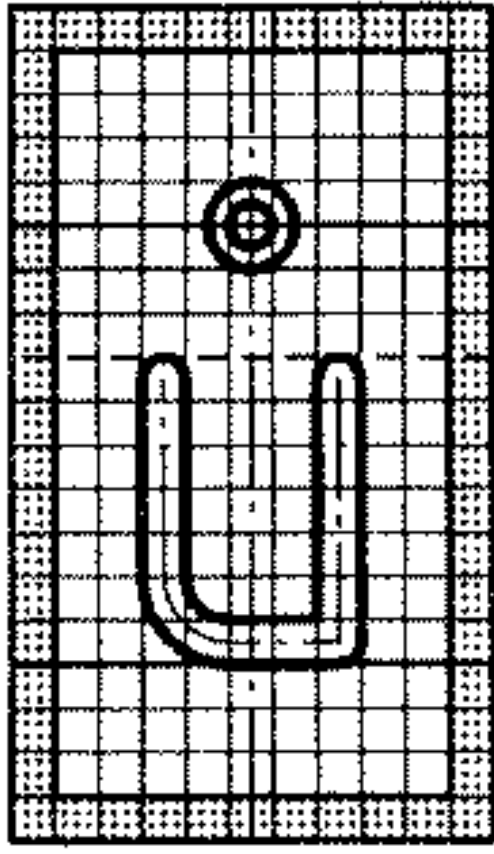
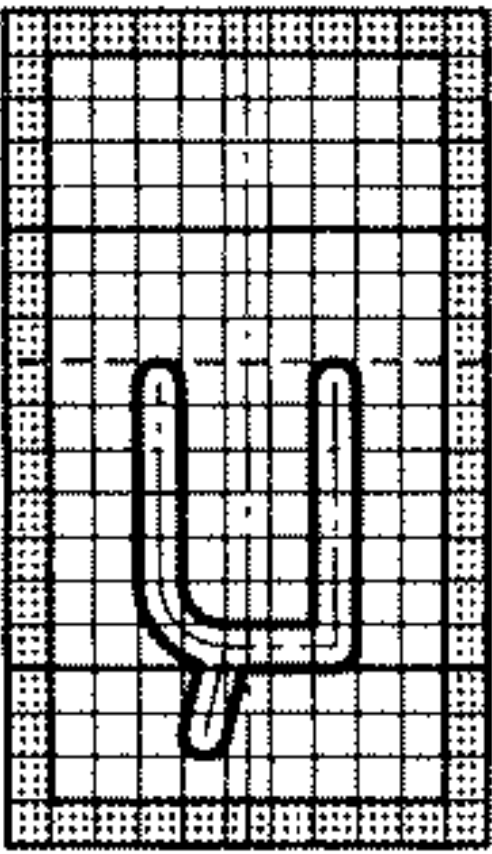
 121/00	 121/01	 121/02	 121/03	 121/04
	 121/05		 121/07	
		 121/10	 121/11	 121/12

表 4 (续)

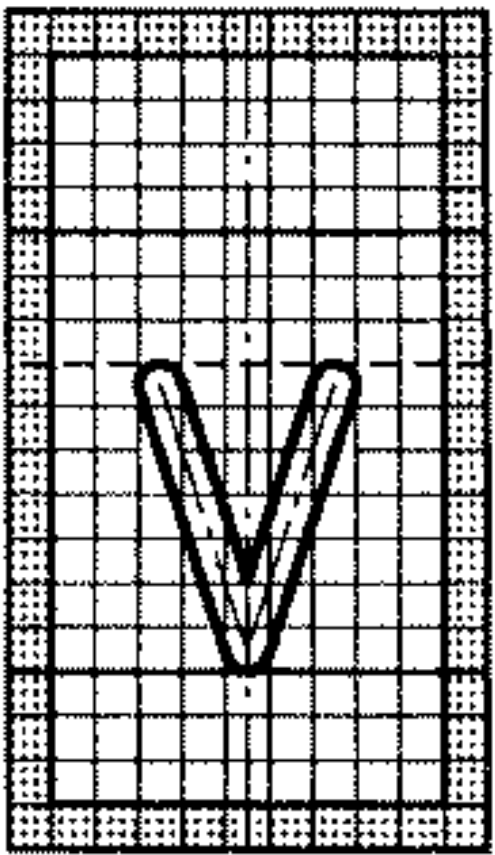
<div></div> <div>122/00</div>				

表 4 (续)

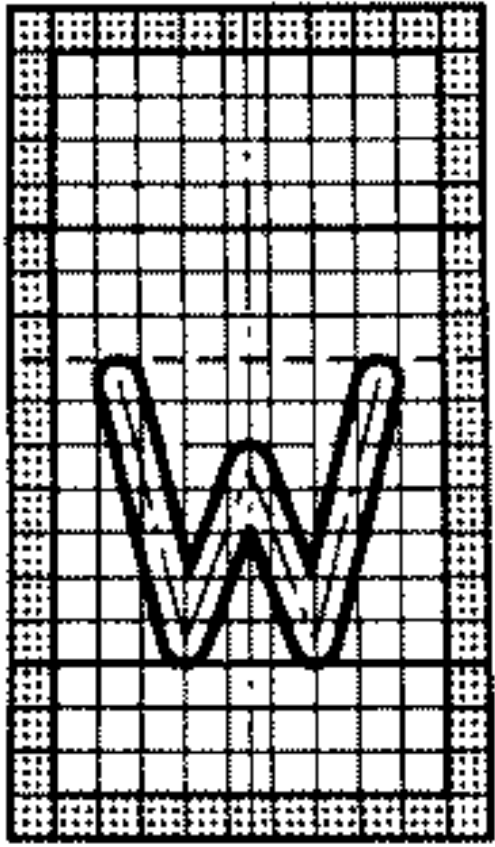
<div><p>123/00</p></div>				

表 4 (续)

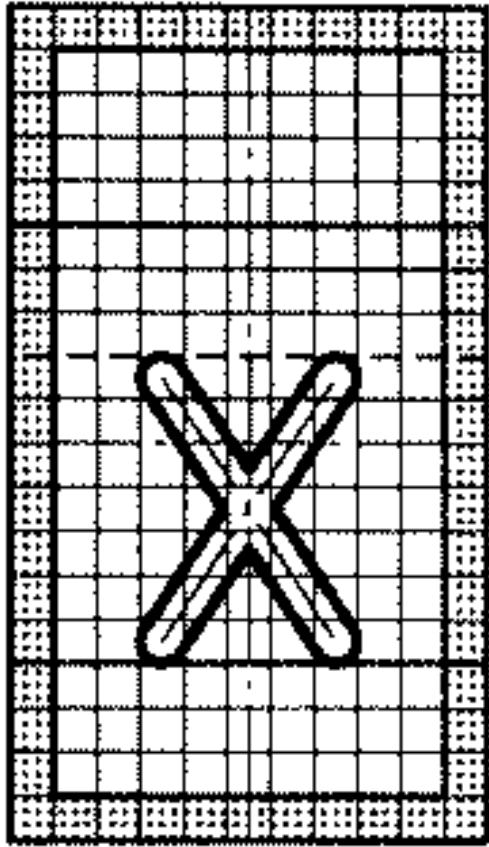
<div> 124/00</div>				

表 4 (续)

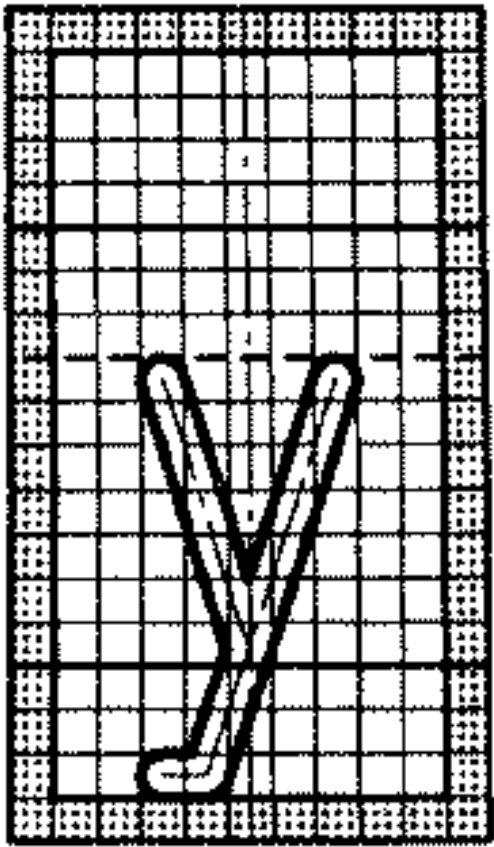
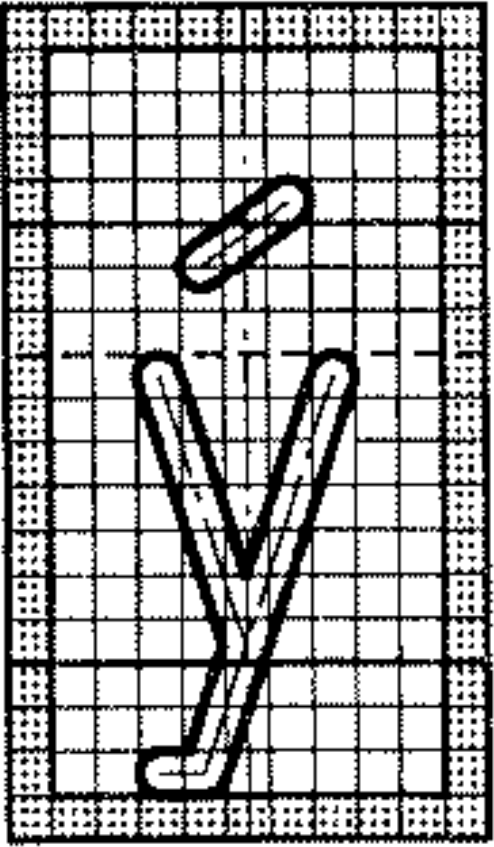
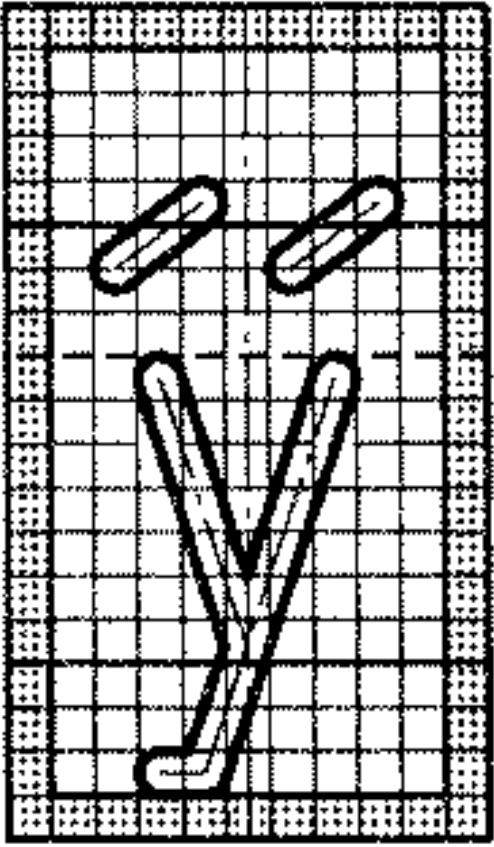
 125/00		 125/02		
			 125/07	

表 4 (续)

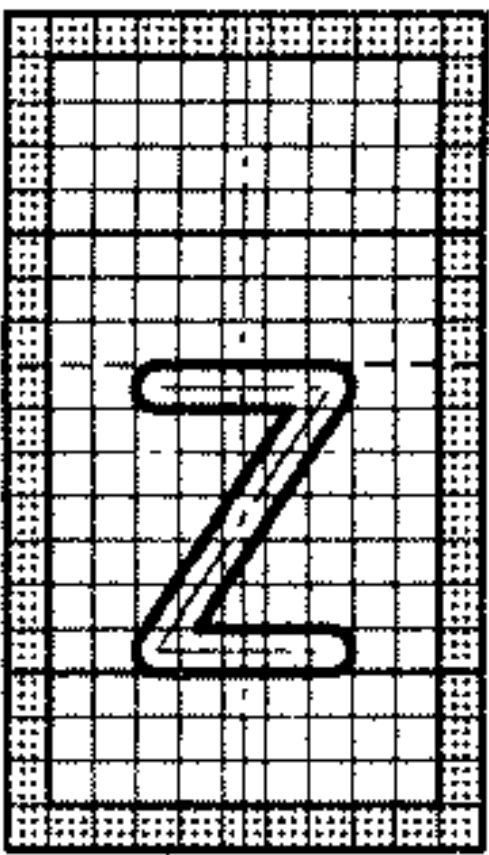
<div></div> <div>126/00</div>				

表 4 (完)

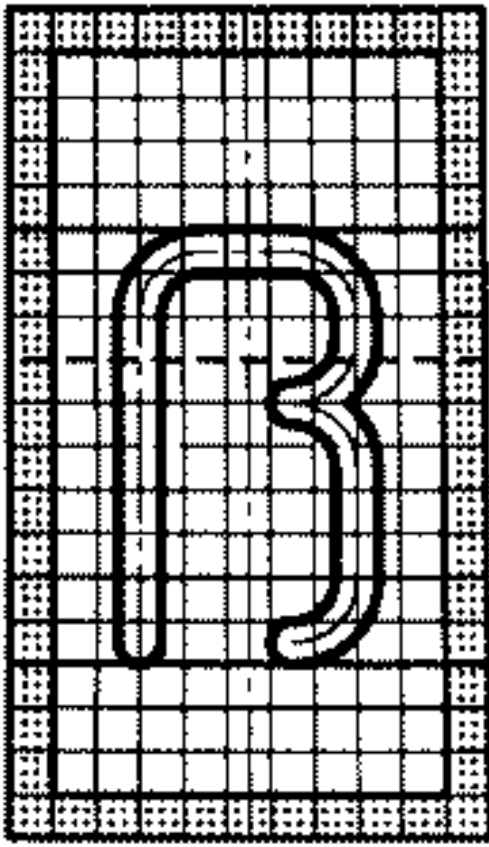
<div></div> <div>127/00</div>				

表 5 数字

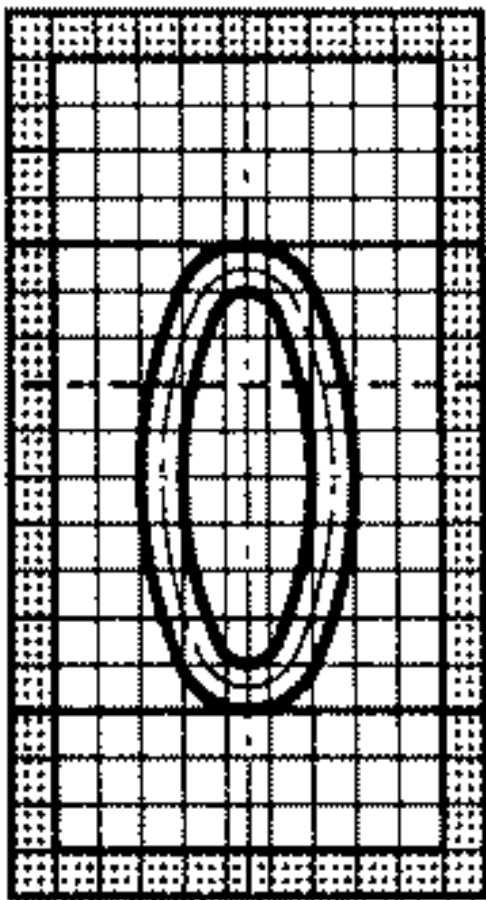
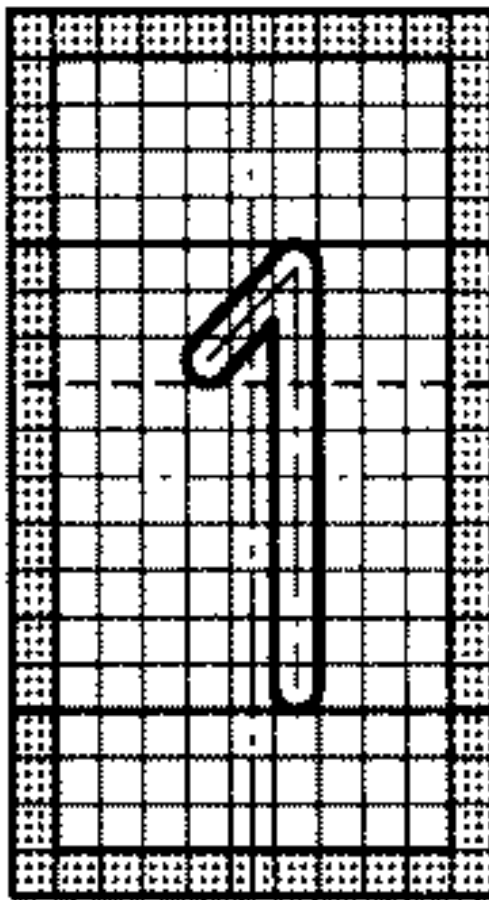
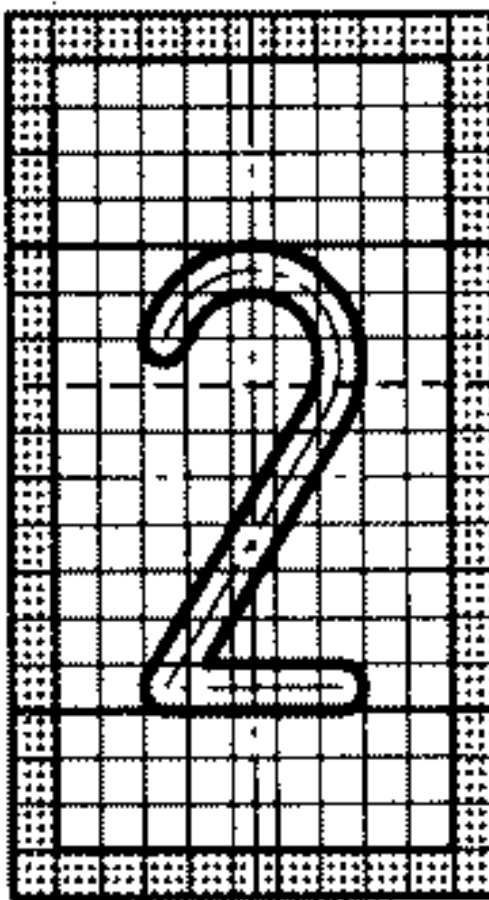
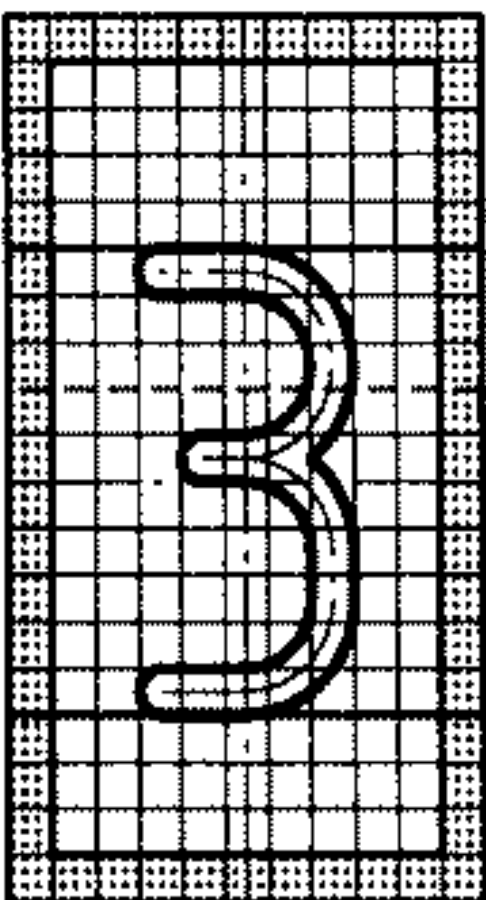
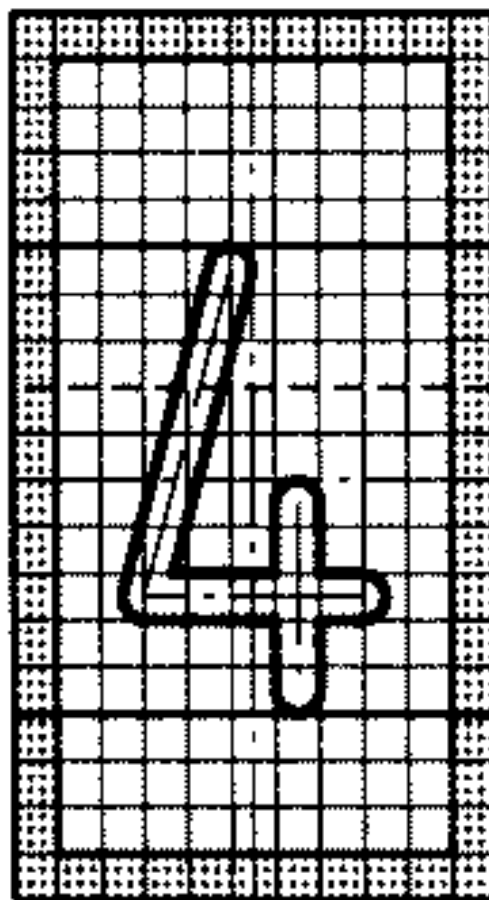
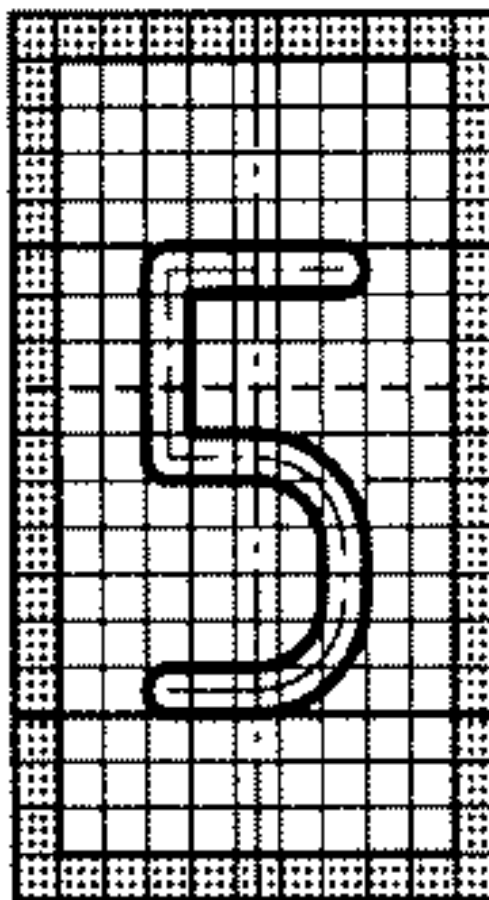
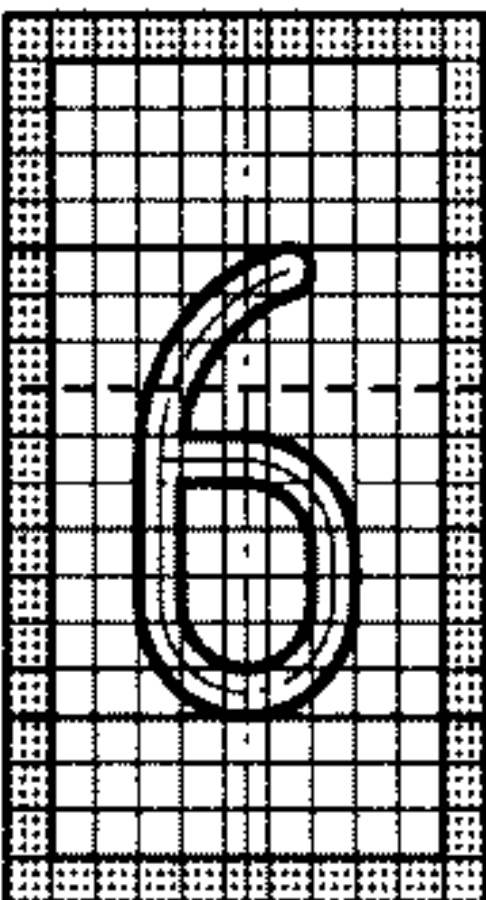
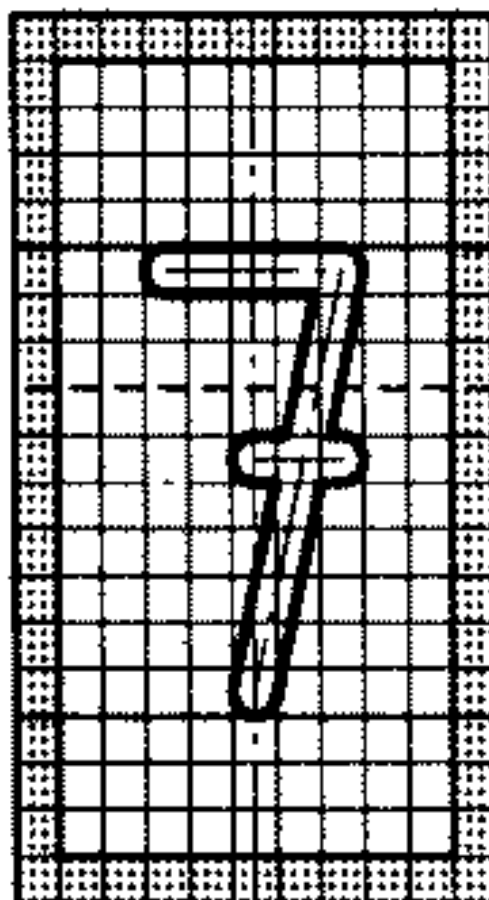
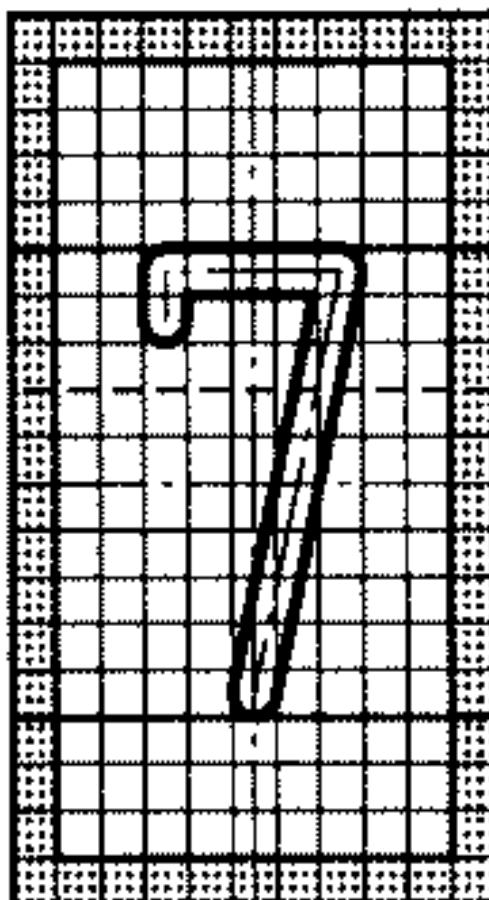
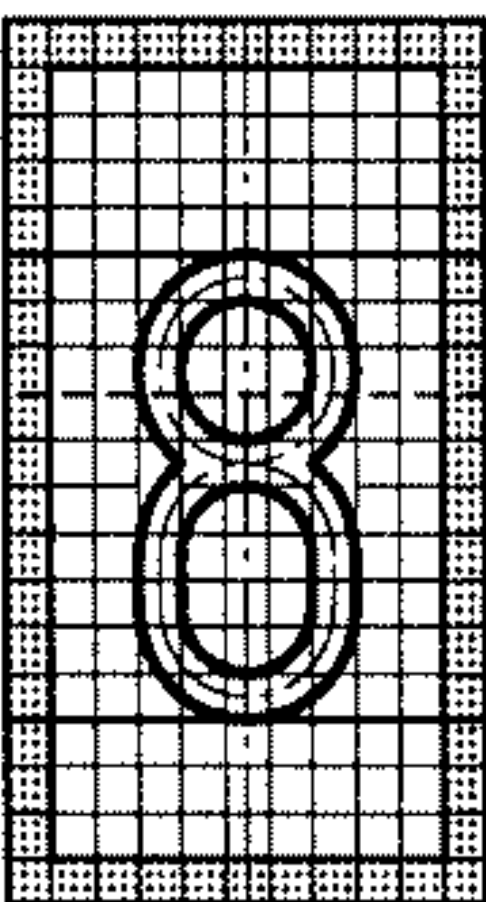
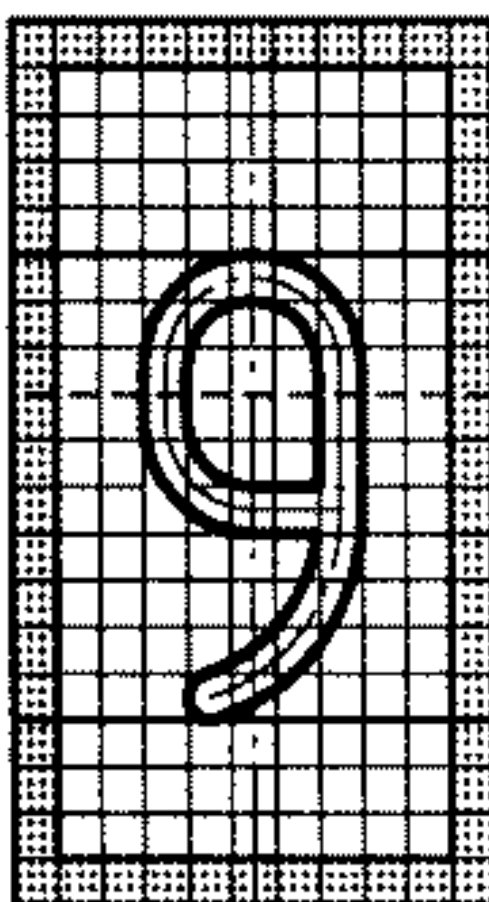
 201	 202	 203
 204	 205	 206
 207	 208	 209
 210	 211	

表 6 符号

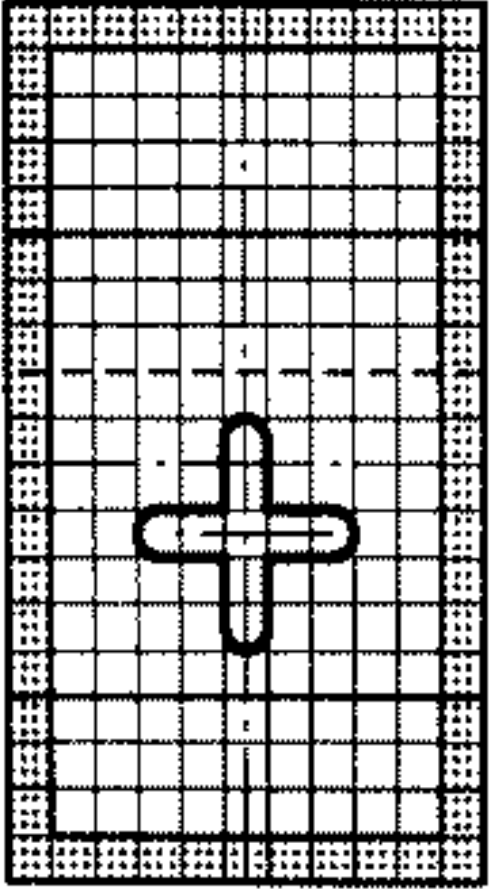
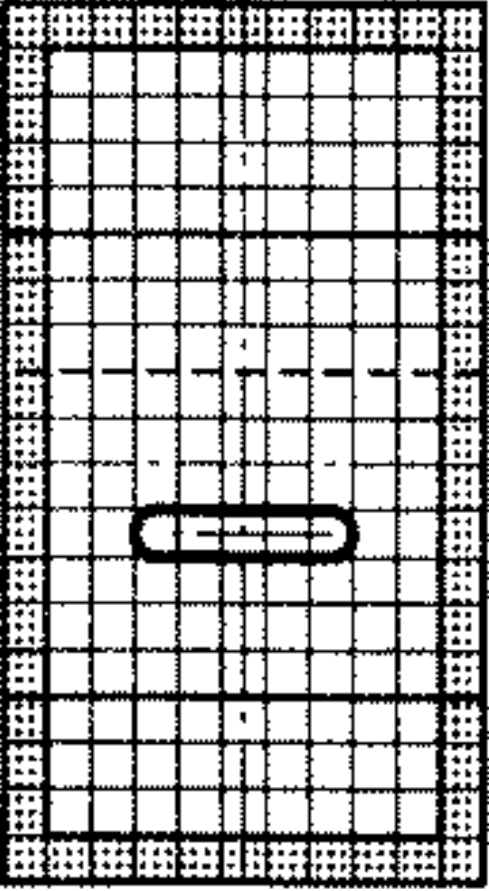
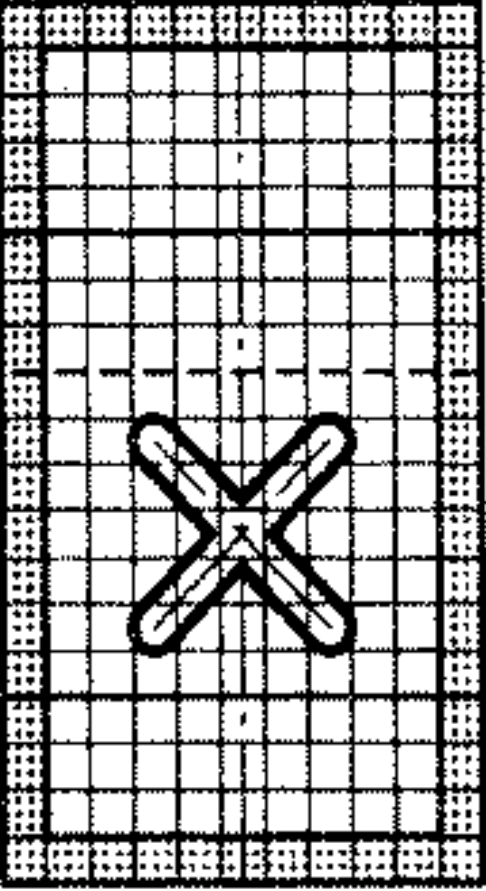
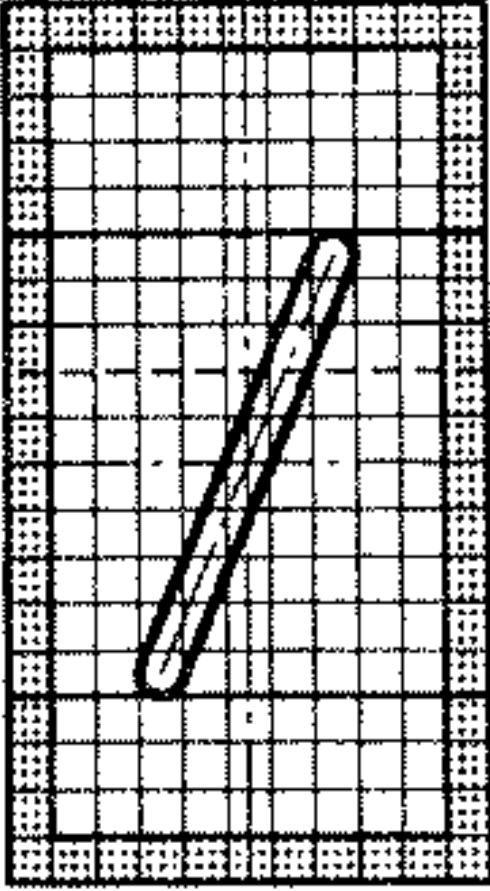
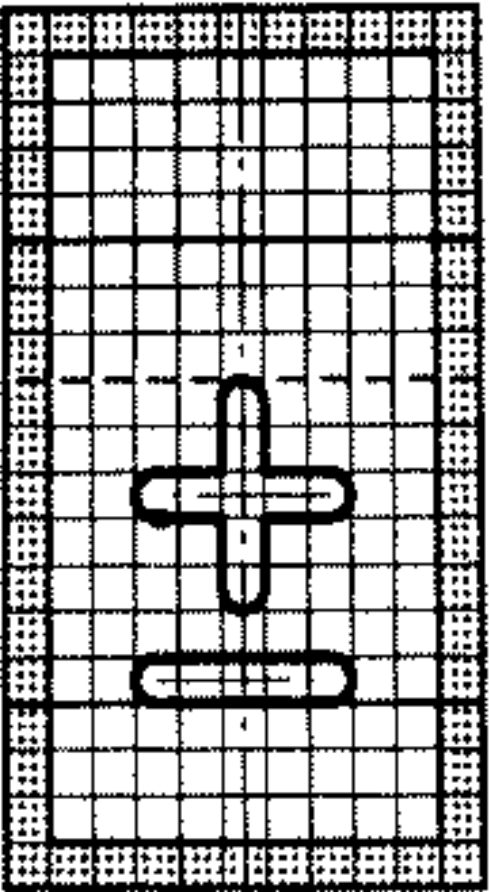
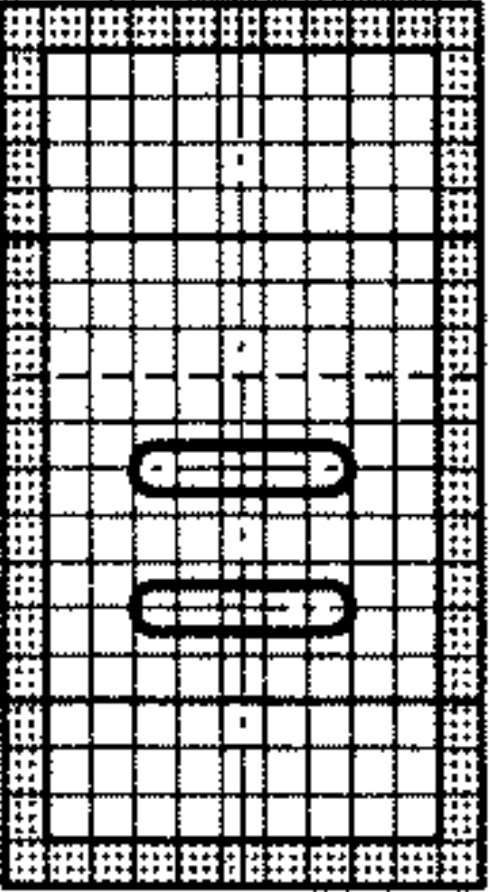
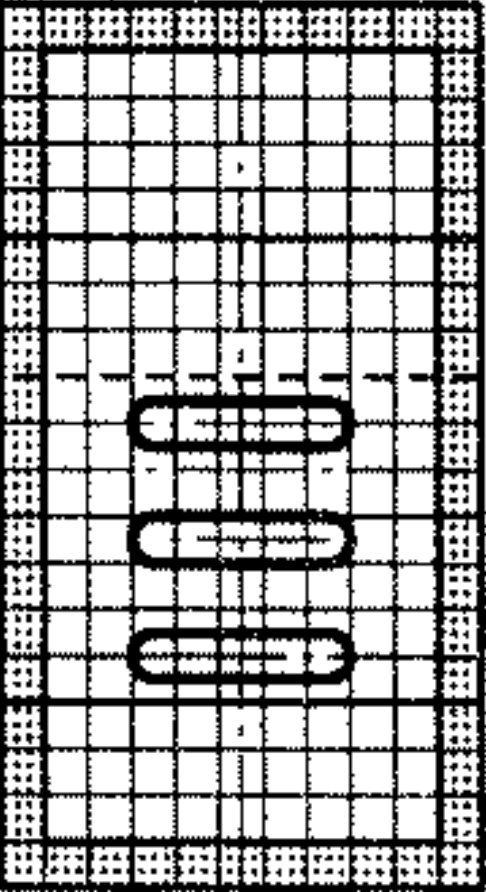
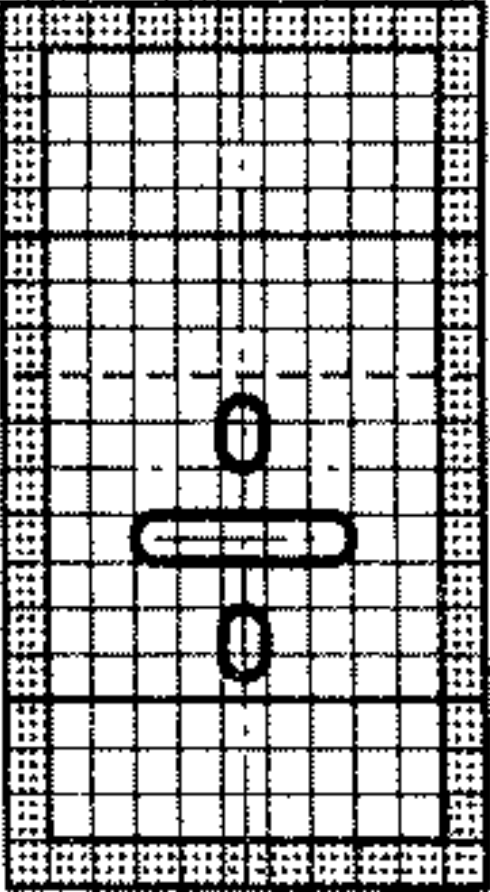
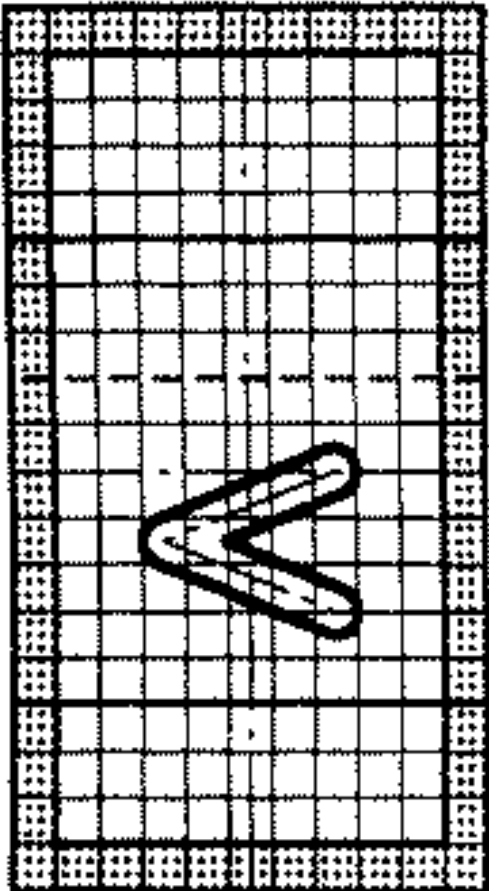
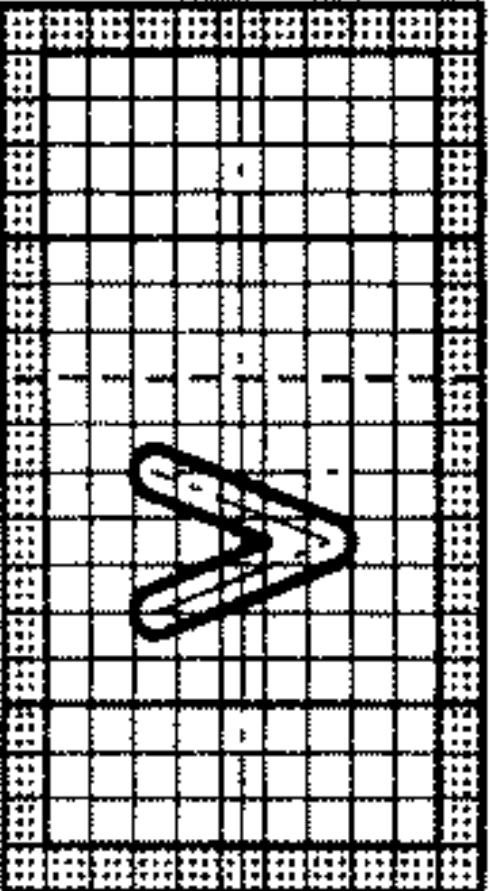
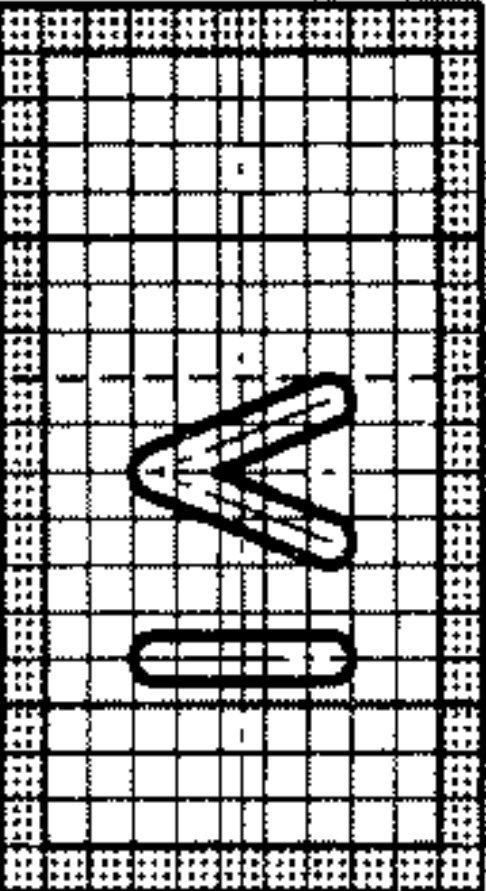
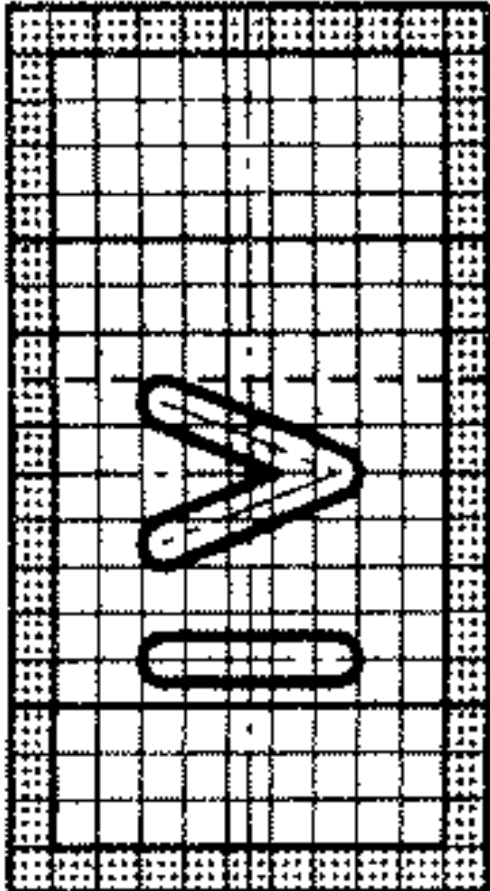
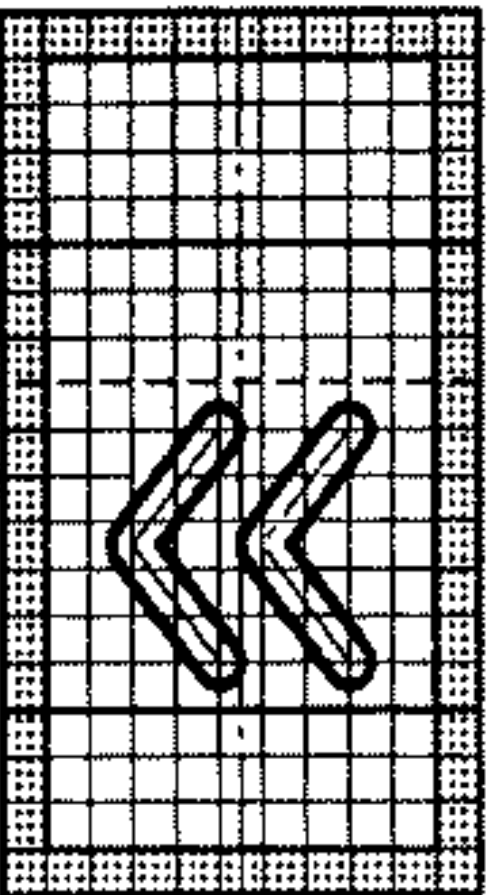
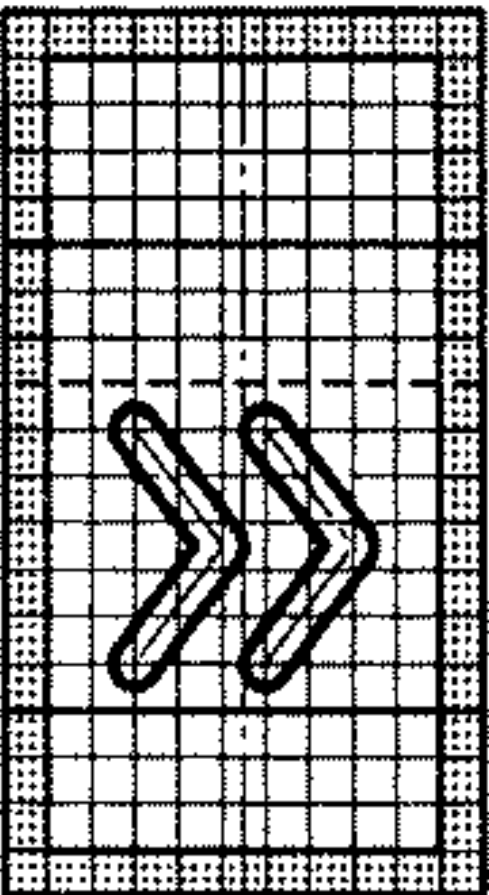
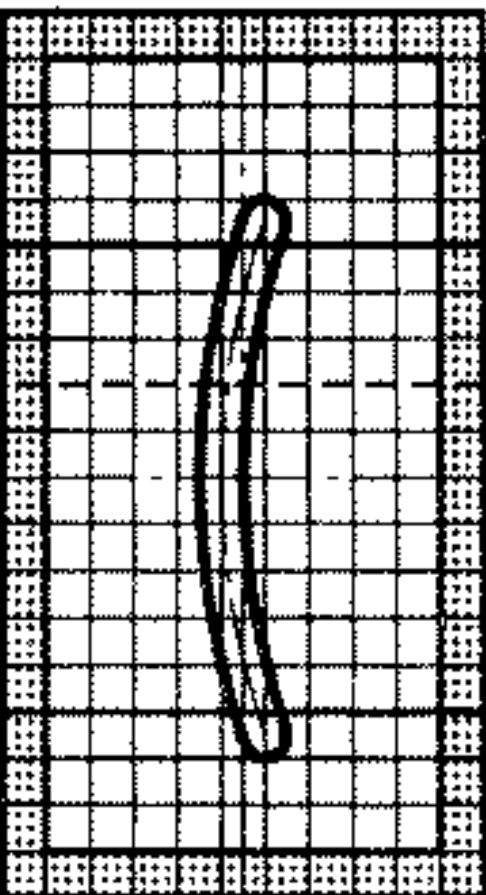
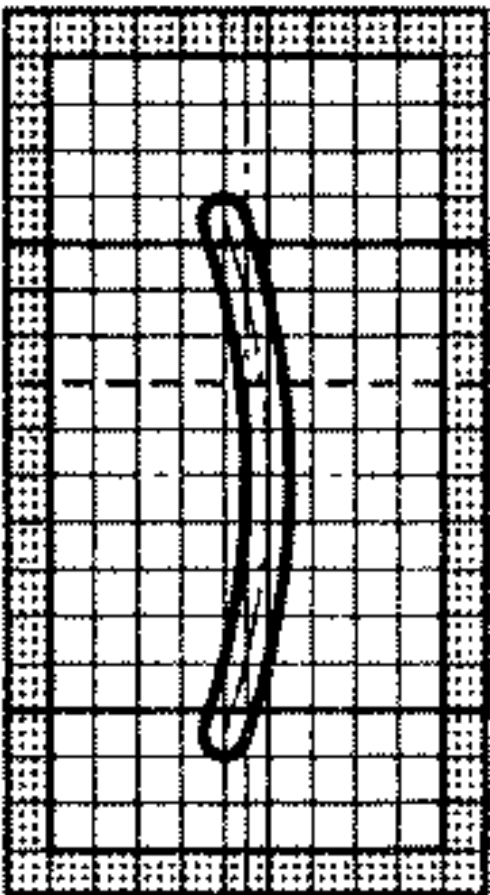
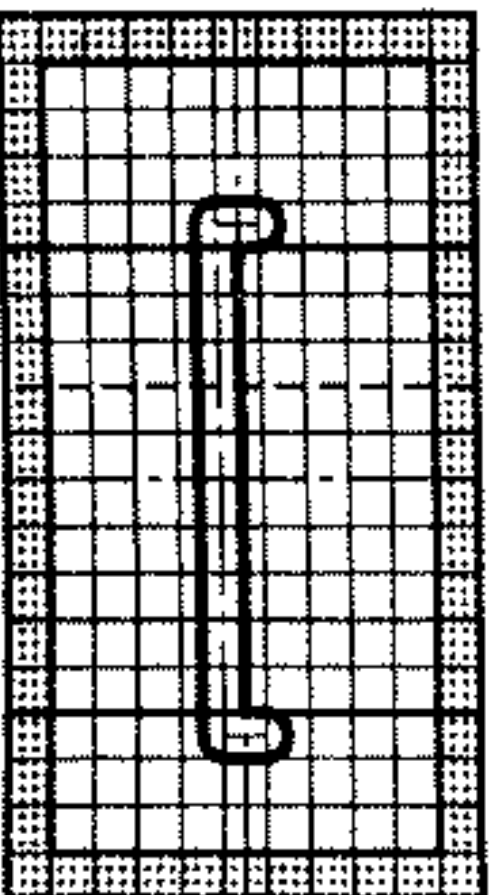
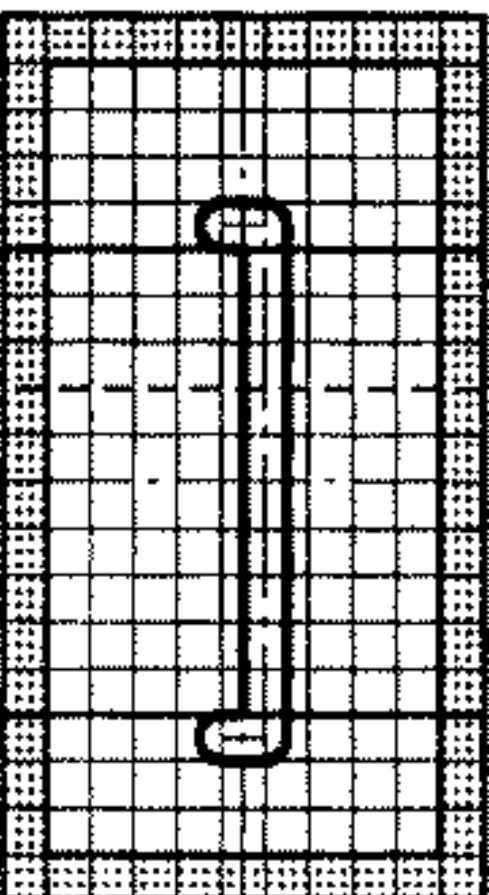
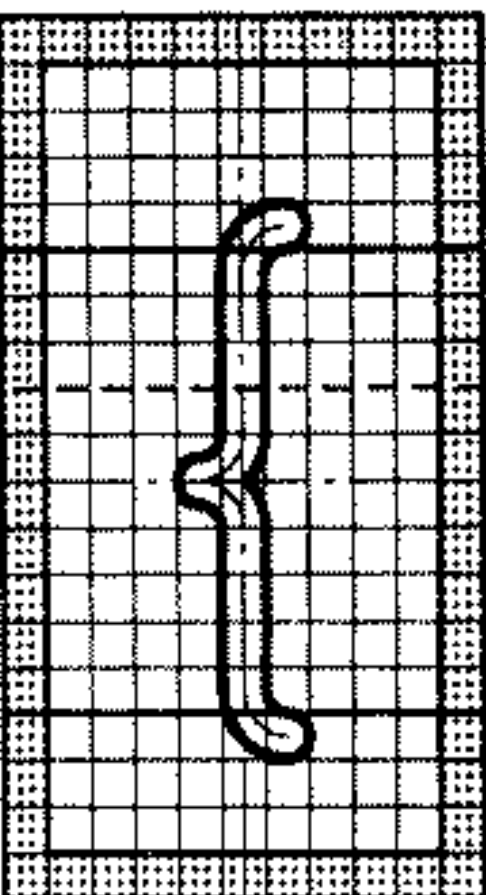
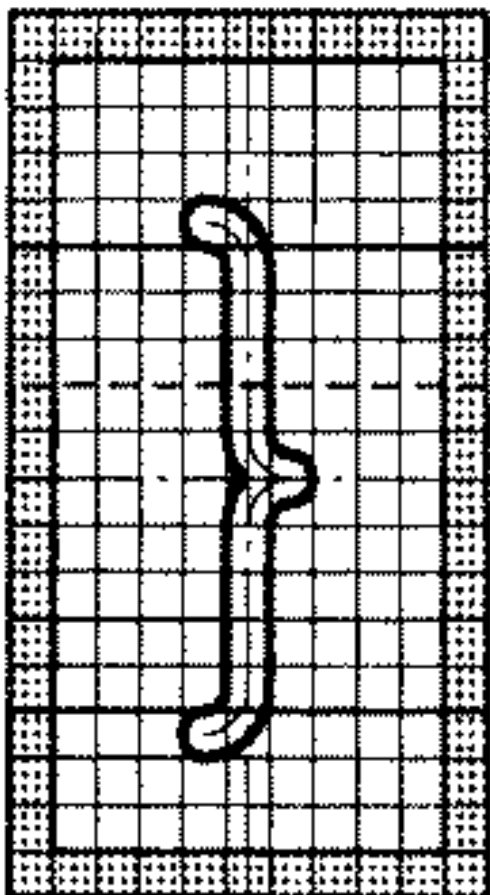
			
301	302	303	304
			
305	306	307	308
			
309	310	311	312
			
313	314	315	316
			
317	318	319	320

表 6 (续)

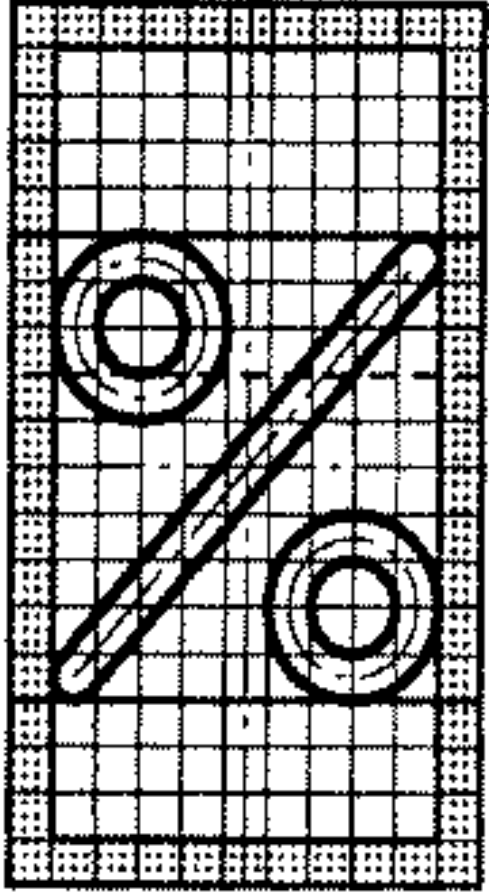
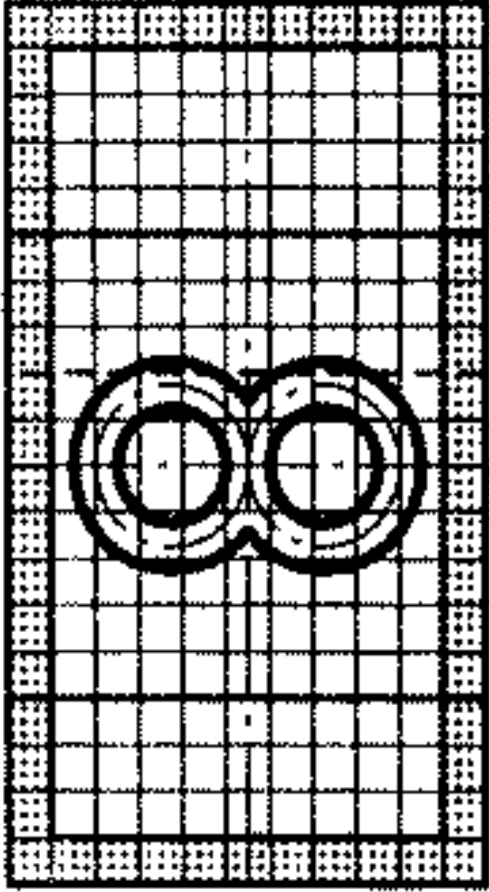
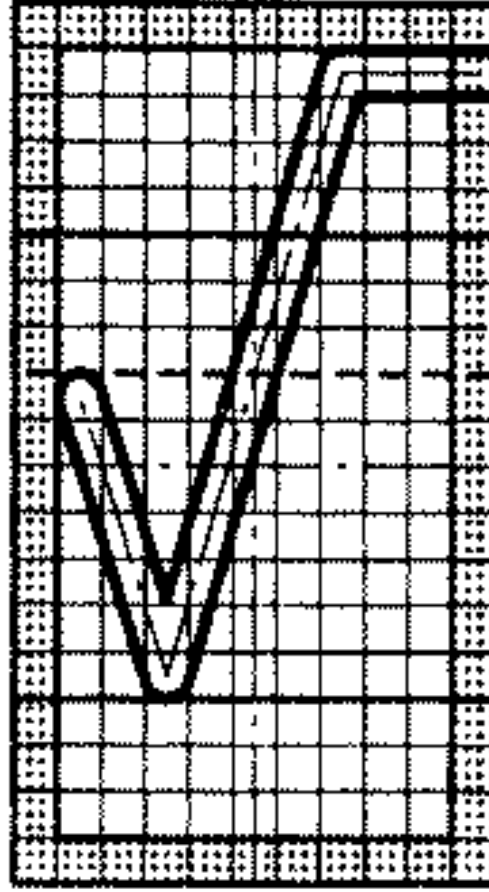
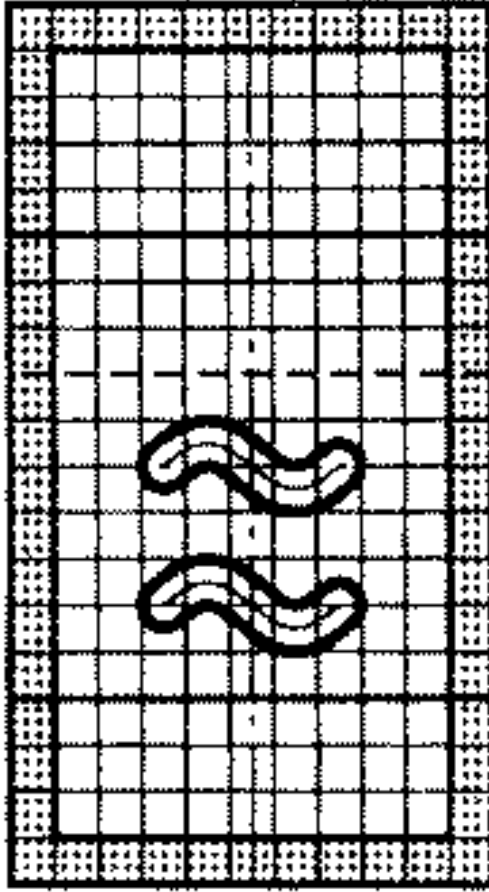
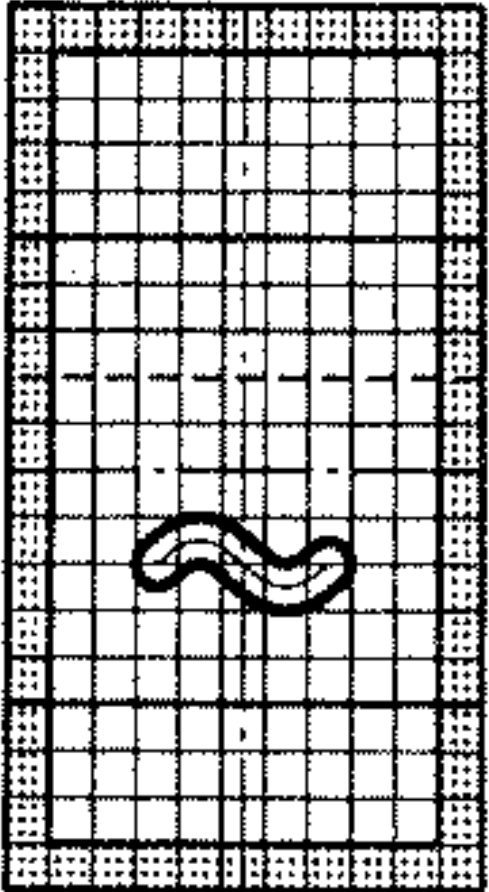
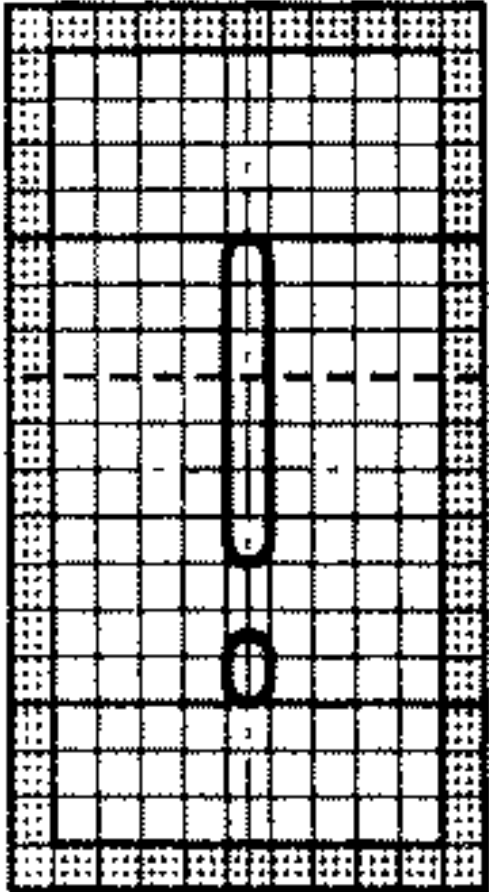
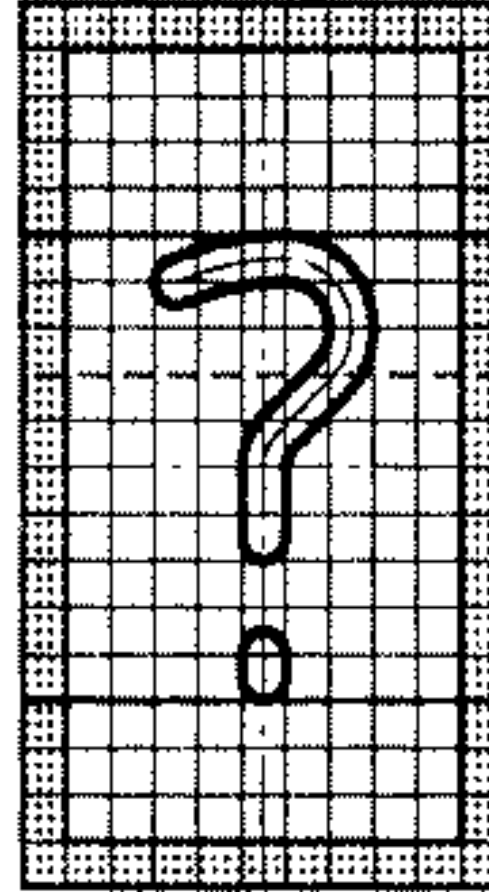
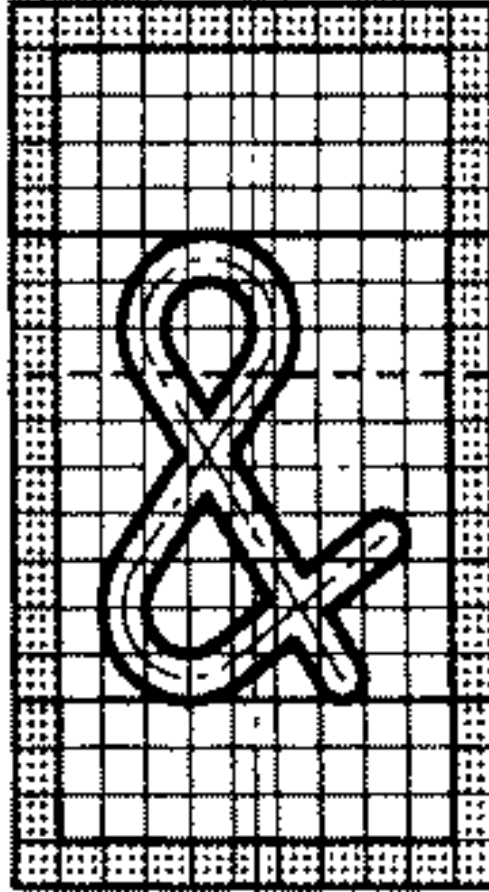
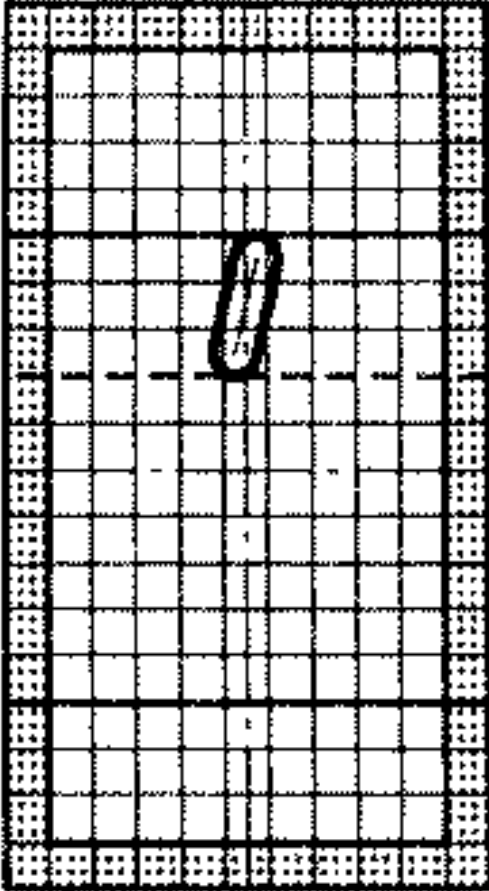
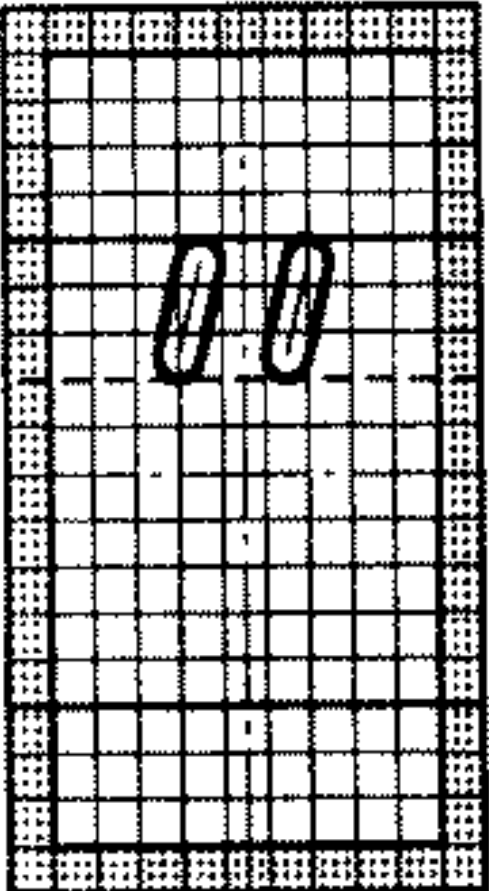
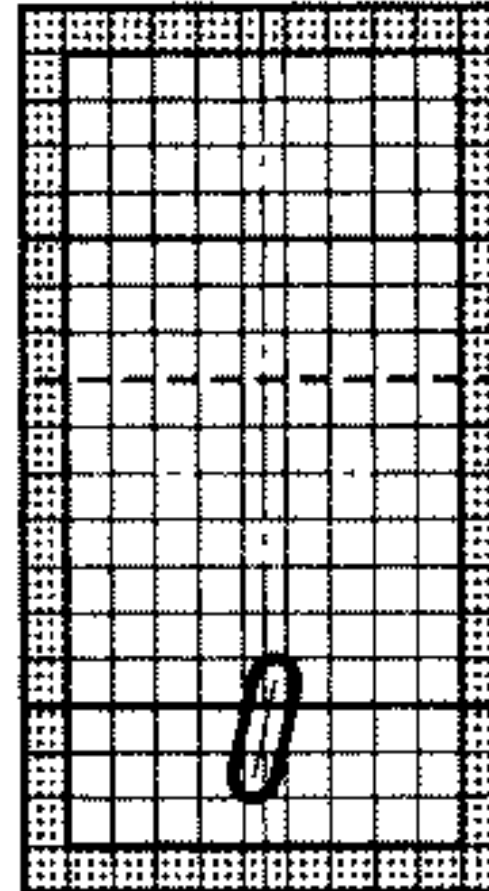
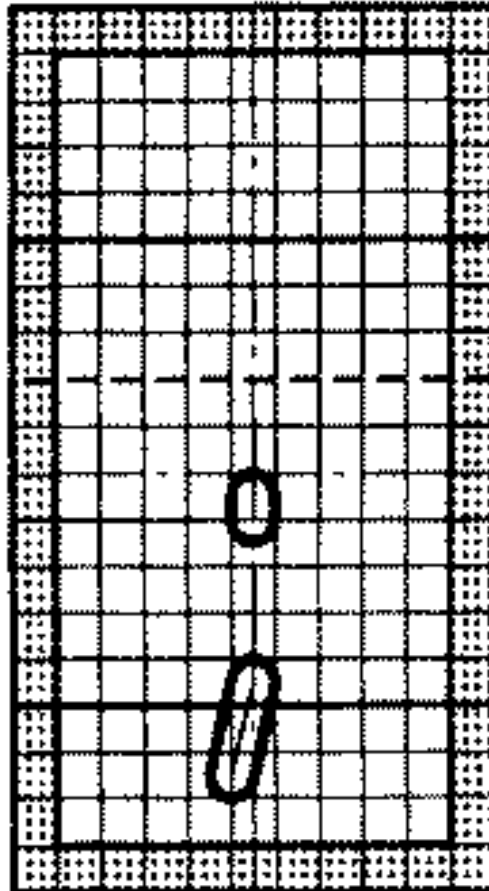
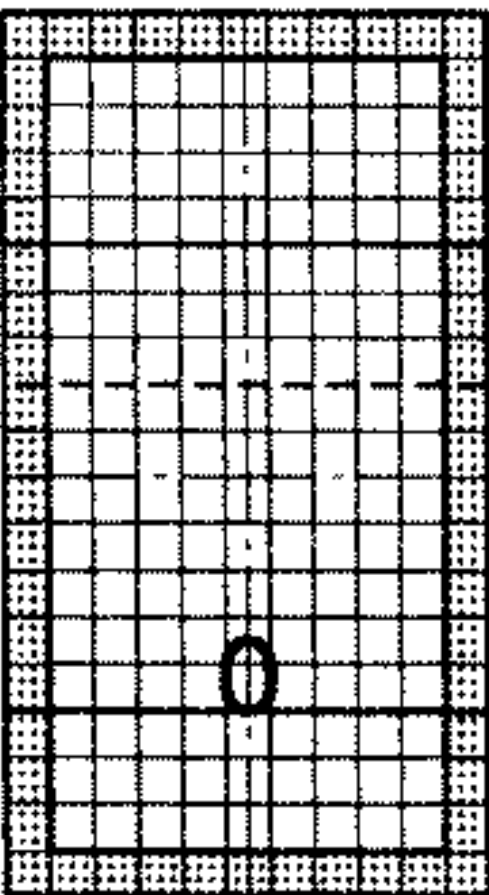
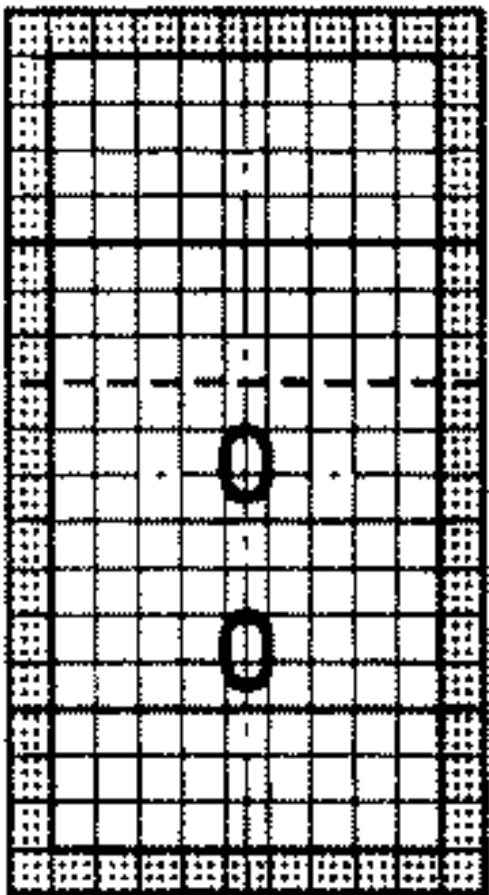
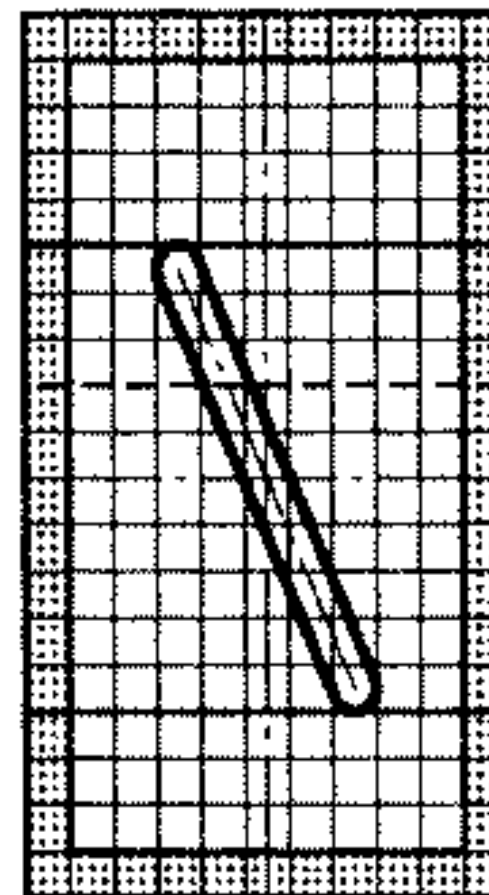
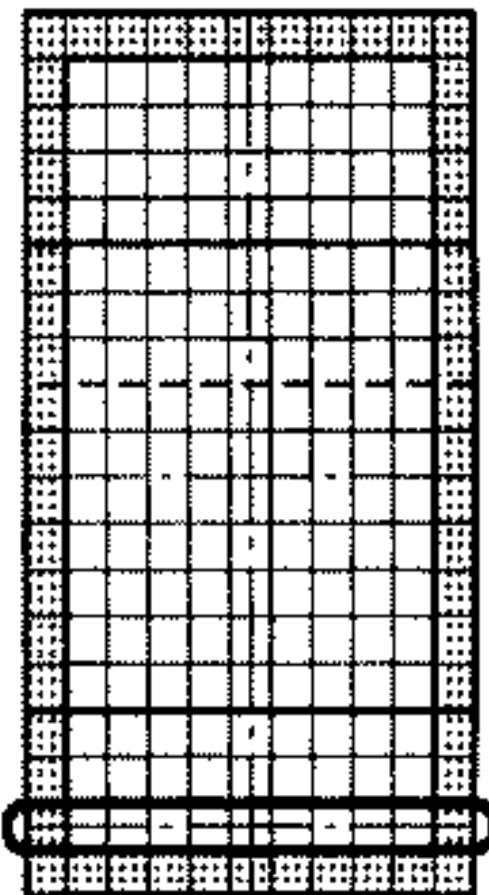
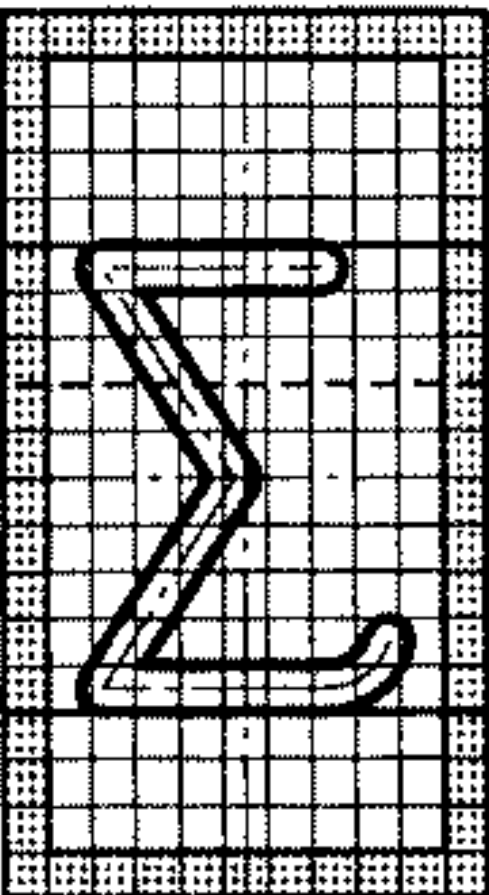
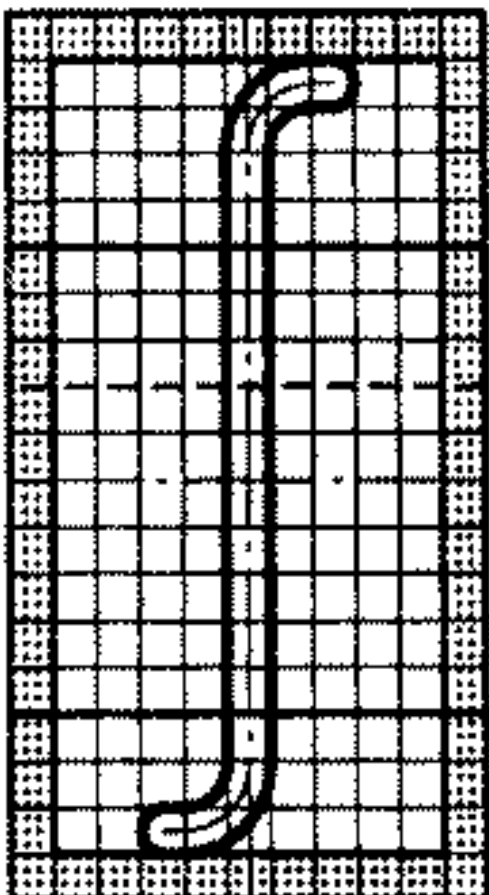
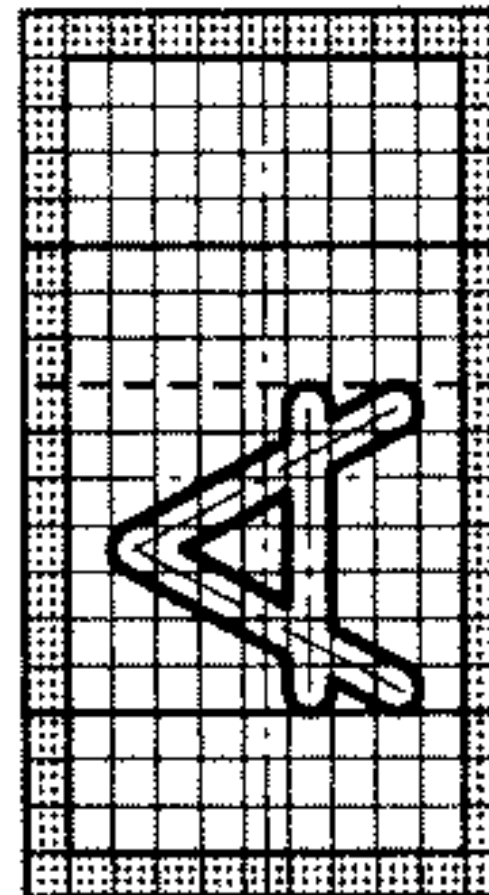
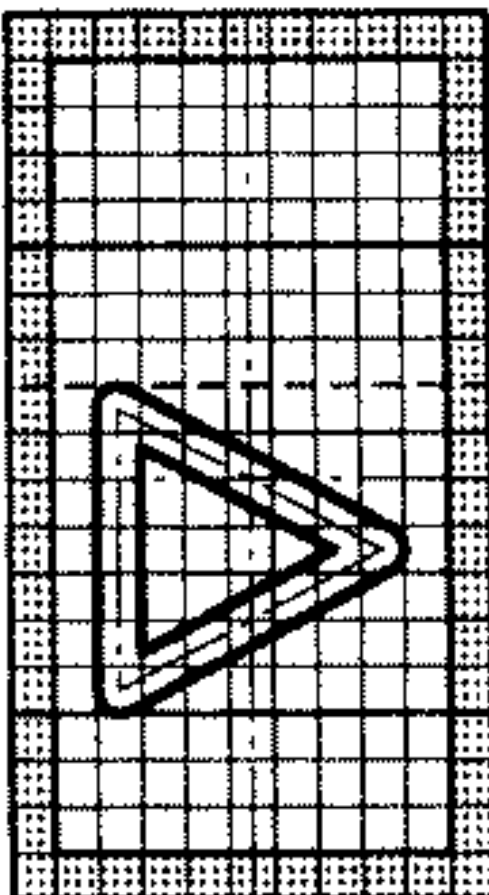
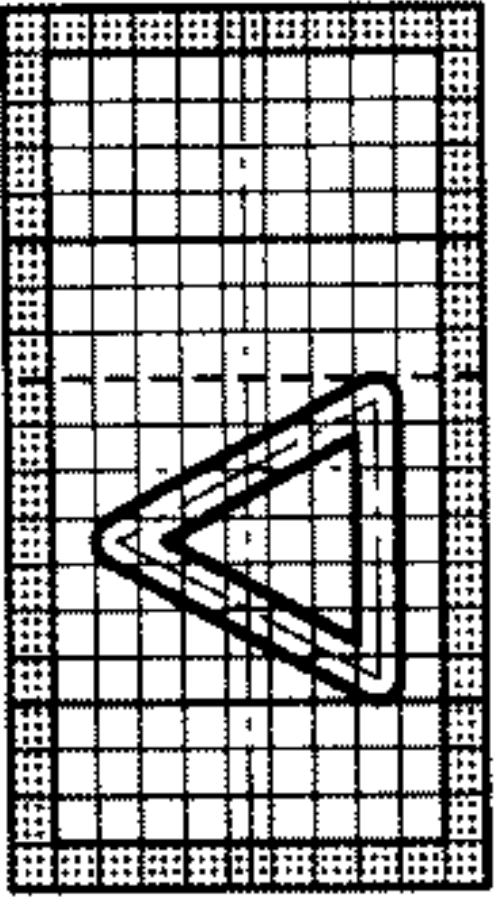
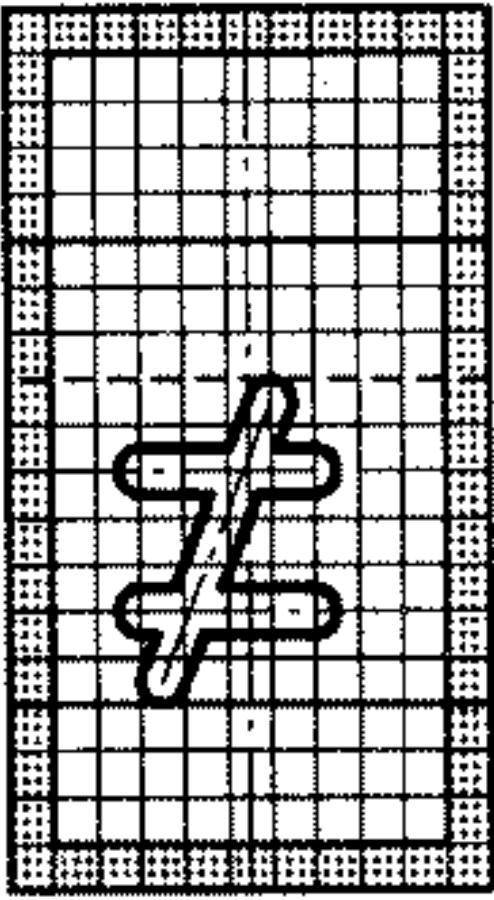
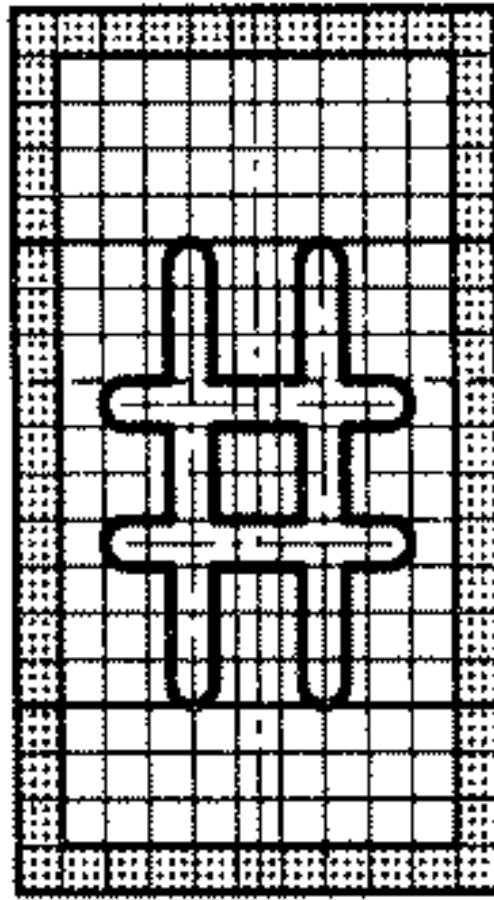
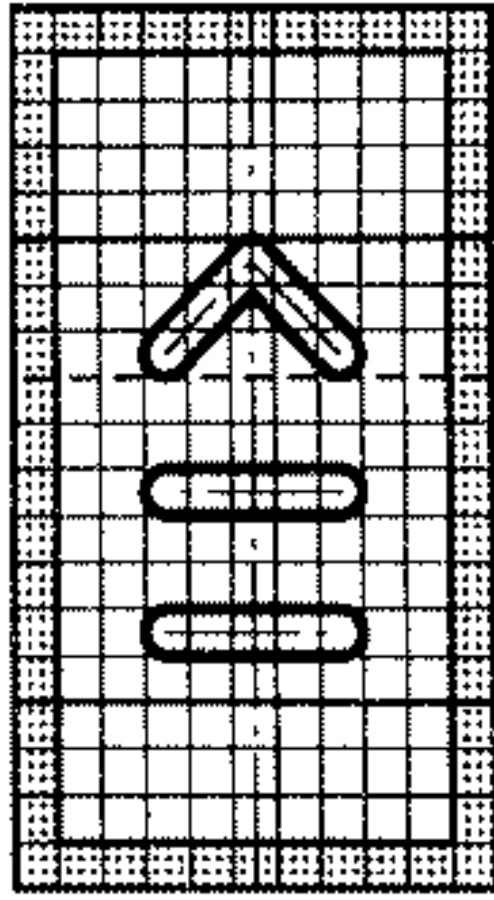
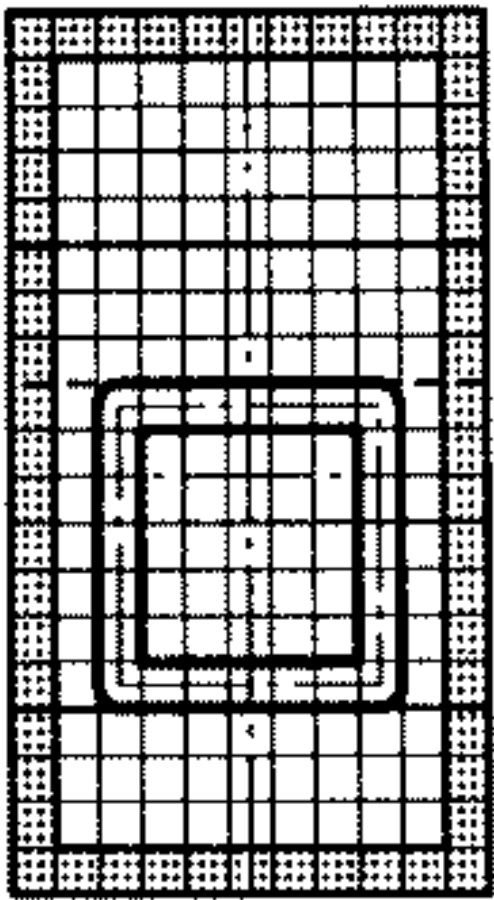
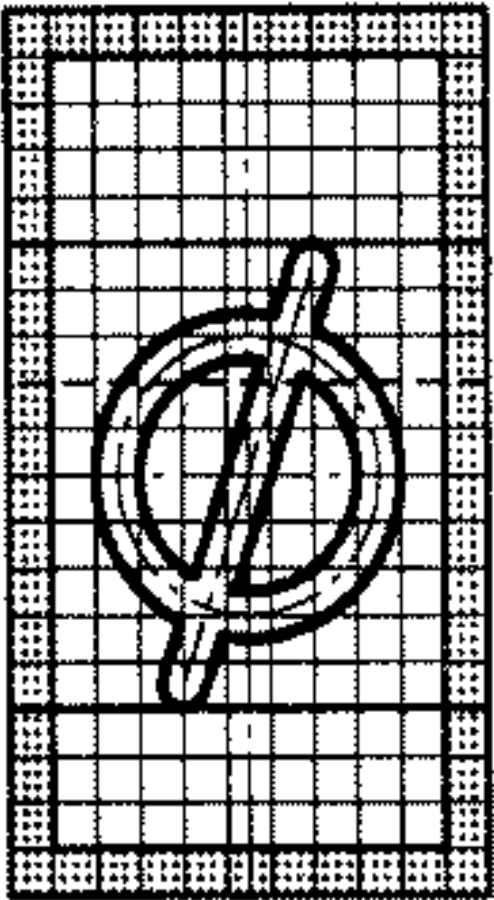
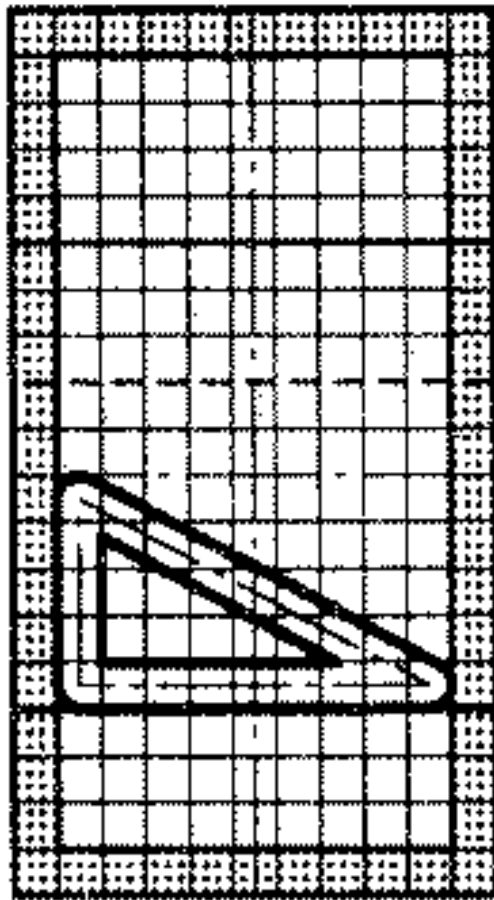
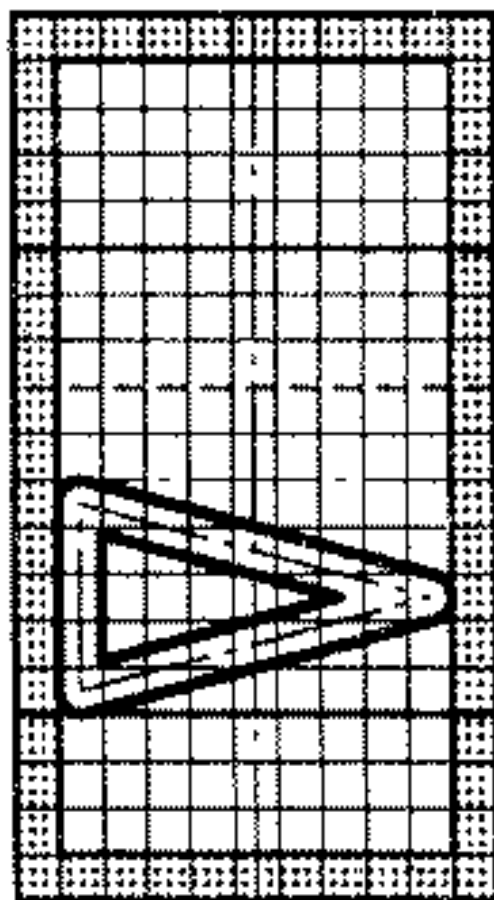
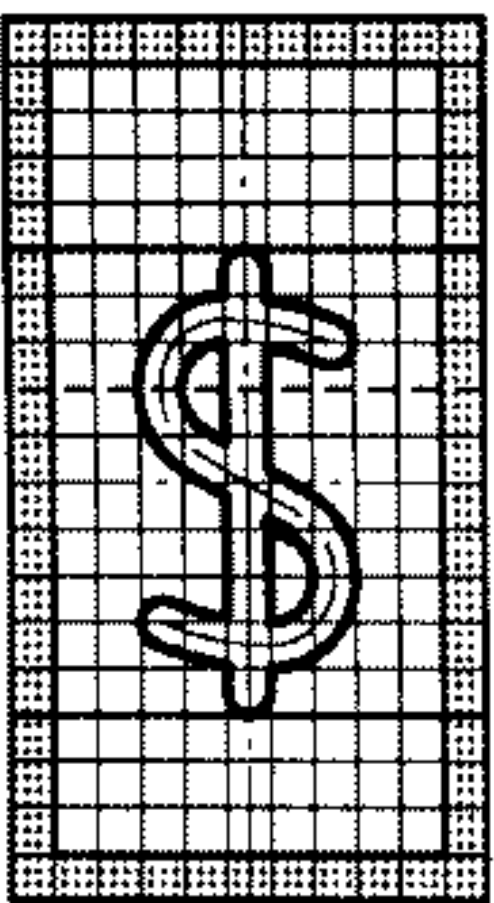
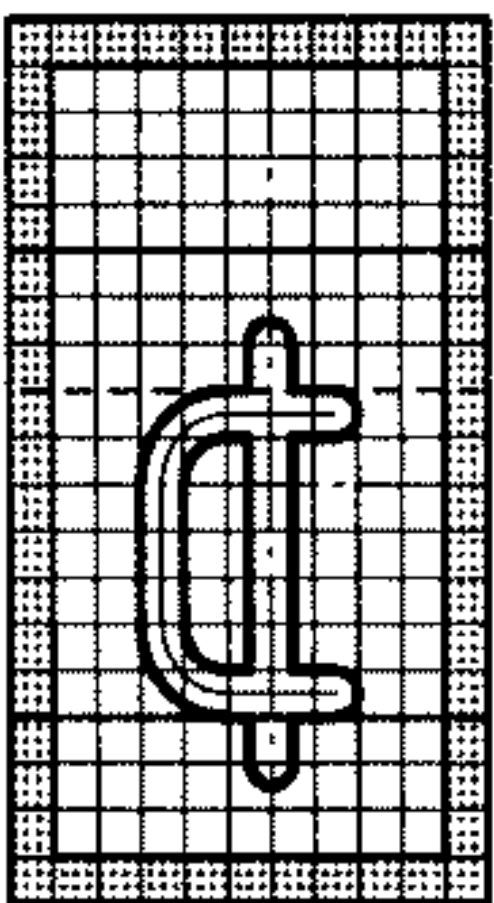
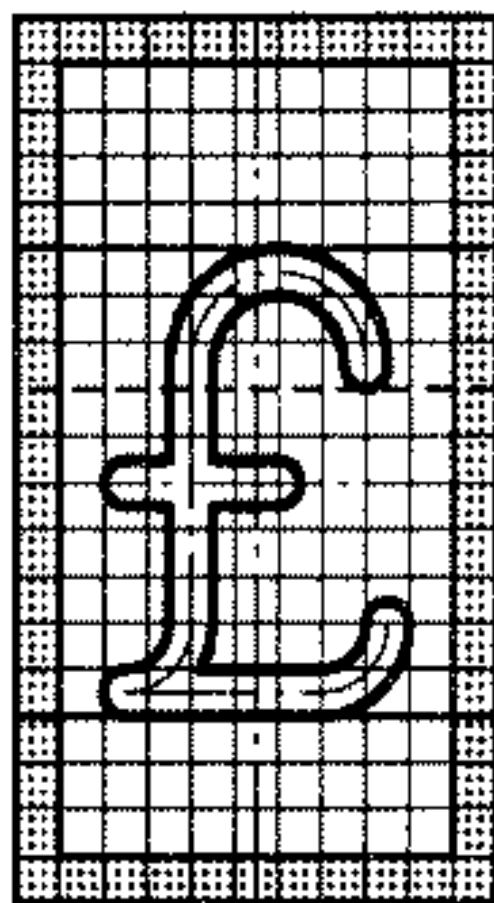
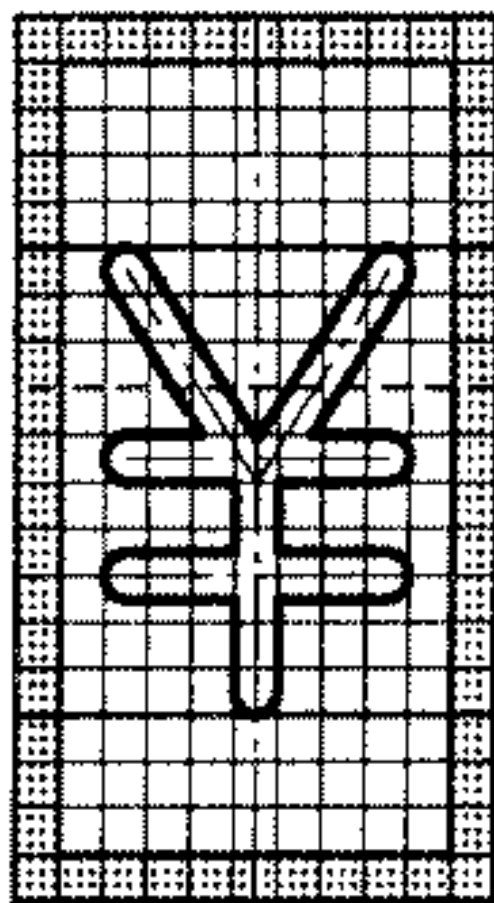
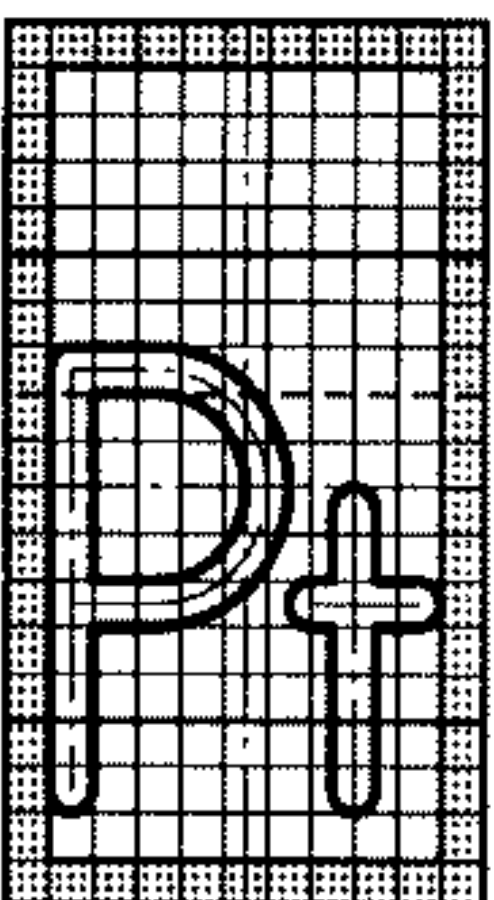
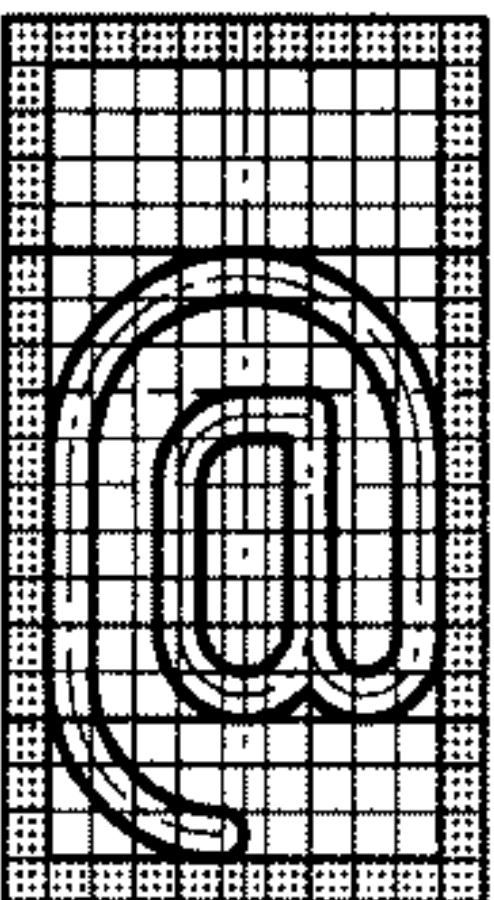
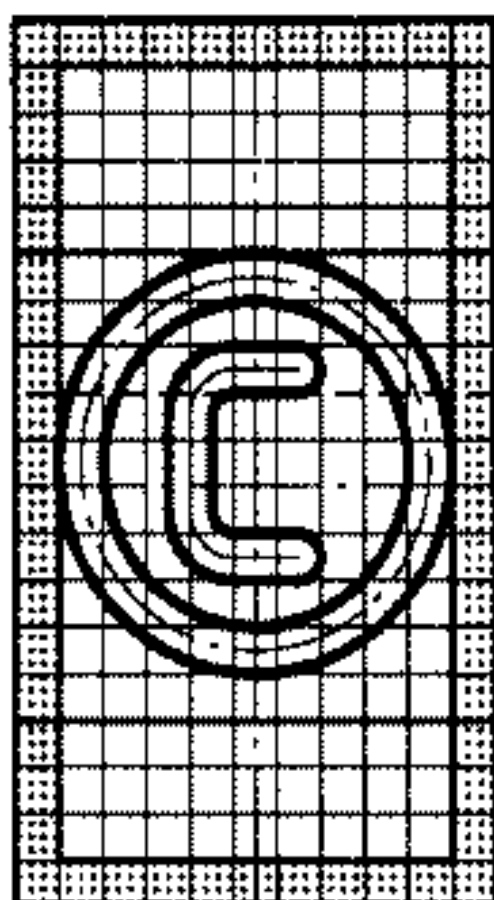
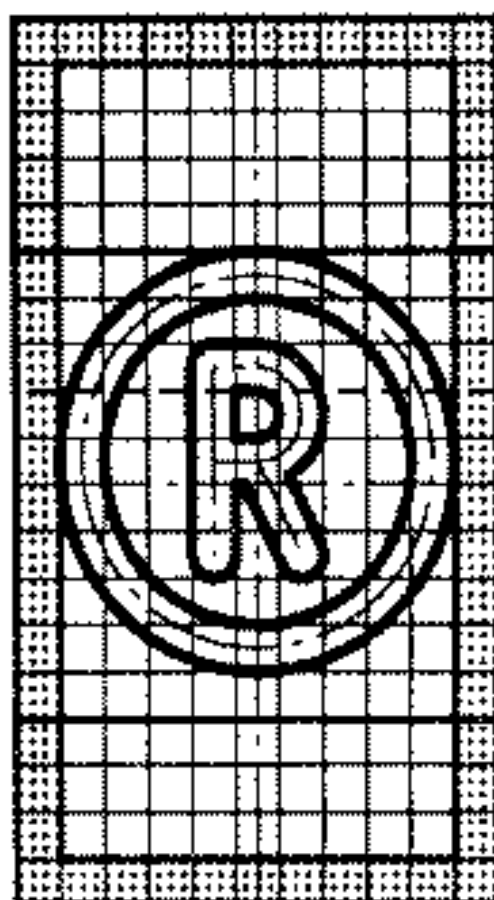
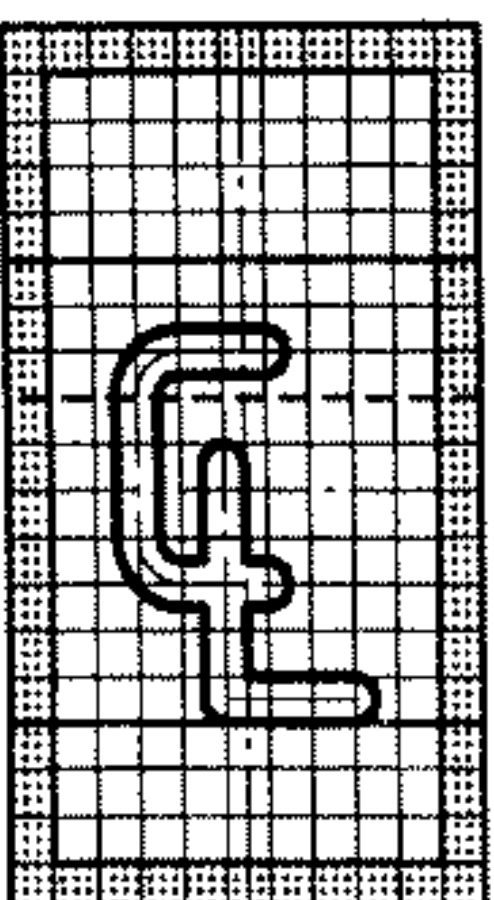
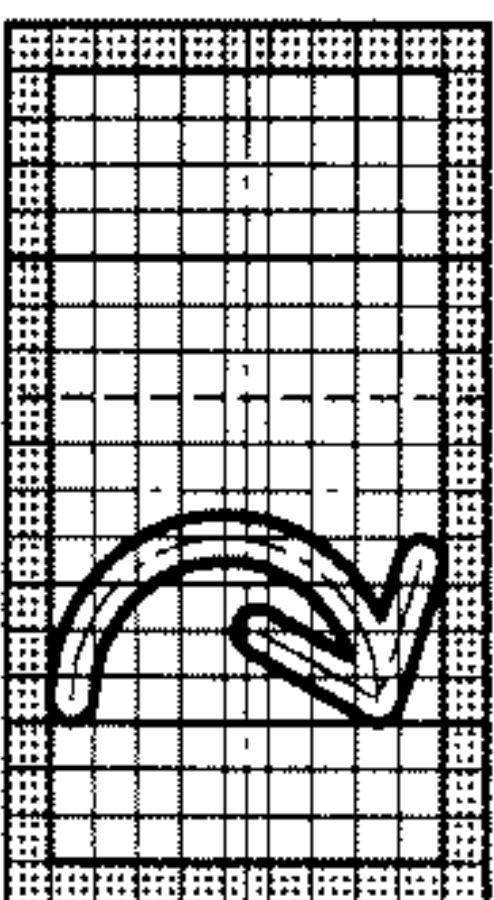
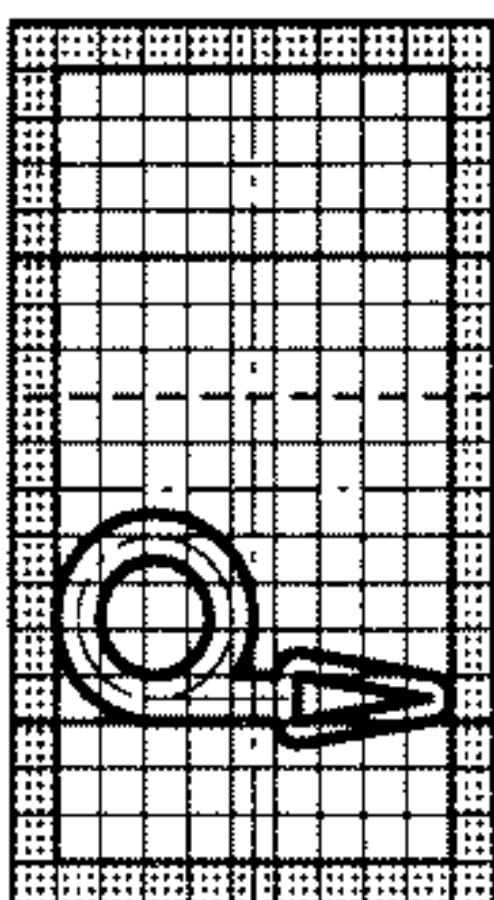
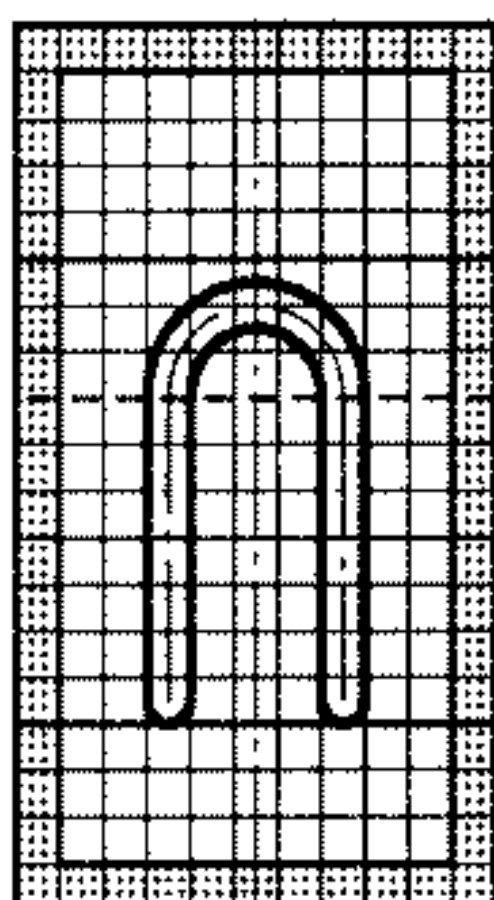
			
321	322	323	324
			
325	326	327	328
			
329	330	331	332
			
333	334	335	336
			
337	338	339	340

表 6 (完)

 <p>341</p>	 <p>342</p>	 <p>343</p>	 <p>344</p>
 <p>345</p>	 <p>346</p>	 <p>347</p>	 <p>348</p>
 <p>349</p>	 <p>350</p>	 <p>351</p>	 <p>352</p>
 <p>353</p>	 <p>354</p>	 <p>355</p>	 <p>356</p>
 <p>357</p>	 <p>358</p>	 <p>359</p>	 <p>360</p>